Vol. 1041 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENT

April 3, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced at 1039 O.G. 142 on Feb. 21, 1984.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Prior corresponding U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Jan. 30, 1984. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Feb. 1984

Affirmed	194
Affirmed in Part	25
Reversed	71
Total	290

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,137,265, Re. S.N. 568,625, Filed Jan. 6, 1984, Cl. 546/388, WATER-INSOLUBLE NITROGEN-CONTAINING POLYOLS, Gayle D. Edwards, et al., Owner of Record: *Texaco Development Corp., White Plains, N.Y.,* Attorney or Agent: Robert A. Kulason, Ex. Gp.: 124

4,159,282, Re. S.N. 572,784, Filed Jan. 20, 1984, Cl. 585/481, XYLENE ISOMERIZATION, David H. Olson, et al., Owner of Record: *Mobil Oil Corp., New York, N.Y.,* Attorney or Agent: Alexander J. McKillop, et al., Ex. Gp.: 116

4,397,736, Re. S.N. 572,713, Filed Jan. 20, 1984, Cl. 208/11, HYDROTREATING SUPERCRITICAL SOLVENT EXTRACTS IN THE PRESENCE OF ALKANE EXTRACTANTS, Jim Y. Low, Owner of Record: *Phillips Petroleum Co., Bartlesville, Okla.,* Attorney or Agent: Louis N. French, et al., Ex. Gp.: 116

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,472,714, Reexam. No. 90/000,507, Requested: Feb. 22, 1984, Cl. 156/96, METHOD OF REBUILDING PREVIOUSLY USED TIRES, Bradley E. Ragan, Owner of Record: *Brad Ragan, Inc., Spruce Pine, N.C.,* Attorney or Agent: Bell, Seltzer, et al., Ex. Gp.: 163, Requester: Bandag, Inc., Muscatine, Iowa

3,527,969, Reexam. No. 90/000,522, Requested: Mar. 7, 1984, Cl. 406/197, SOUNDPROOFED HOUSING FOR ELECTRIC MOTORS, Hermann Papst, Owner of Record: *Requester,* Attorney or Agent: Theodore J. Koss, Jr., Ex. Gp.: 313, Requester: Papst-Motoren GmbH & Co., KG, Fed. Rep. of Germany

3,920,075, Reexam. No. 90/000,520, Requested: Mar. 2, 1984, Cl. 166/290, METHOD FOR POSITIONING A LINER ON A TUBULAR MEMBER IN A WELL BORE WITH A RETRIEVABLE PACK OFF BUSHING THEREBETWEEN, Britt O. Braddick, et al., Owner of Record: *Texas Iron Works, Inc., Houston, Tex.,* Attorney or Agent: Jack W. Hayden, Ex. Gp.: 356, Requester: Otis Engineering Corp., Dallas, Tex.

3,948,636, Reexam. No. 90/000,515, Requested: Mar. 2, 1984, Cl. 71/112, FLOWABLE AQUEOUS COMPOSITIONS OF WATER-INSOLUBLE PESTICIDES, Alfred F. Marks, Owner of Record: *SDS Biotech Corp., Painesville, Ohio,* Attorney or Agent: William A. Skinner, Ex. Gp.: 124, Requester: Peter L. Klempay, Arlington, Va.

3,968,256, Reexam. No. 90/000,510, Requested: Feb. 27, 1984, Cl. 426/38, PREPARATION OF COTTAGE CHEESE, Edmond L. Sing, Owner of Record: *Inventor,* Attorney or Agent: Woodward, Weikart, et al., Ex. Gp.: 174, Requester: Microlife Technics, Inc., Sarasota, Fla.

4,213,317, Reexam. No. 90/000,503, Requested: Feb. 14, 1984, Cl. 70/450, BLANK FILLER PLATE FOR LOCK EDGE CUT-OUT, Robert O. Ruff, Owner of Record: *American Standard, Inc., New York, N.Y.,* Attorney or Agent: Donald F. Frei, Ex. Gp.: 350, Requester: Owner

4,271,470, Reexam. No. 90/000,518, Requested: Mar. 2, 1984, Cl. 364/466, SERIAL DATA BUS FOR USE IN A MULTI-PROCESSOR PARCEL POSTAGE METERING SYSTEM, Daniel F. Dlugos, et al., Owner of Record: *Pitney-Bowes, Inc., Stamford, Conn., & Rockwell International Corp., Anaheim, Calif.,* Attorney or Agent: Albert W. Scribner, Ex. Gp.: 237, Requester: Pitney Bowes, Inc., Stamford, Conn.

4,281,711, Reexam. No. 90/000,517, Requested: Mar. 2, 1984, Cl. 166/118, APPARATUS FOR POSITIONING A LINER ON A TUBULAR MEMBER IN A WELL BORE WITH A RETRIEVABLE PACK OFF BUSHING THEREBETWEEN, Britt O. Braddick, et

al., Owner of Record: *Texas Iron Works, Inc., Houston, Tex.*, Attorney or Agent: Jack W. Hayden, Ex. Gp.: 350, Requester: Otis Engineering Corp., Dallas, Tex.

4,330,503, Reexam. No. 90/000,509, Requested: Feb. 27, 1984, Cl. 422/177, WOOD BURNING STOVE, Roger A. Allaire, et al., Owner of Record: *Corning Glass Works, Corning, N.Y.*, Attorney or Agent: Richard N. Wardell, Ex. Gp.: 110, Requester: Peter L. Klempay, Arlington, Va.

4,336,075, Reexam. No. 90/000,516, Requested: Mar. 5, 1984, Cl. 148/2, ALUMINUM ALLOY PRODUCTS AND METHOD OF MAKING SAME, William E. Quist, et al., Owner of Record: *The Boeing Co., Seattle, Wash.*, Attorney or Agent: Christensen, O'Conner, et al., Ex. Gp.: 111, Requester: Pechiney Direction de la Propriete Industrielle Des Accords Techniques et de la Documentation, Lyon Cedex 3, France

4,345,528, Reexam. No. 90/000,512, Requested: Feb. 27, 1984, Cl. 110/203, WOOD BURNING STOVE, Roger A. Allaire, et al., Owner of Record: *Corning Glass Works, Corning, N.Y.*, Attorney or Agent: Richard N. Wardell, Ex. Gp.: 344, Requester: Peter L. Klempay, Arlington, Va.

COMMISSIONER ORDERED REEXAMINATIONS

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,088,624, Reexam. No. 90/000,514, Requested: Mar. 22, 1984, Cl. 24/68, LINE TENSIONER, Steven T. Gol- COMPOSITIONS, Asita Bhattacharyya, et al., Owner of Record: *Societe D'Applications de Procedes Industriels et Chimiques S.A.P.I.C., Asnieres, France,* Attorney or Agent: Richard Leiter Johnston, Ex. Gp.: 142, Requester: Commissioner

4,377,886, Reexam. No. 90/000,513, Requested: Mar. 5, 1984, Cl. 24/68, LINE TENSIONER, Steven T. Golden, Owner of Record: *Steven T. Golden, Santa Paula, Calif.*, Attorney or Agent: William W. Glenny, Ex. Gp.: 350, Requester: Commissioner

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U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Patent Licensing,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-539,907. CONTROL OF BEAN RUST WITH BACILLUS SUBTILIS.

DEPARTMENT OF COMMERCE

SN 6-567,451. PROCESS AND BATH FOR ELECTROPLATING NICKEL-CHROMIUM ALLOYS.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-283,376 (4,428,943). (N-PHOSPHONACETLY-L-ASPARTATO) (1,2-DIAMINOCYCLOHEXANE) PLATINUM-(II) OR ALAKI METAL SALT.
SN 6-408,942 (4,427,664). 2'HALO DEVRIVATIVES OF DAUNOMYCIN, DESMETHOXY DAUNOMYCIN, ADRIAMYCIN AND CARMINOMYCIN.
SN 6-550,040. INTRA-URETHRAL PROSTHETIC SPHINCTER VALVE.
SN 6-565,212. DENTAL COMPOSITE FORMULATIONS AND METHOD.
SN 6-661,114 (4,425,112). FLOW-THROUGH CENTRIFUGE.

DEPARTMENT OF THE AIR FORCE

SN 6-237,021 (4,421,408). HALOGEN MASS FLOW RATE DETECTION SYSTEM.
SN 6-272,441 (4,42[illegible]834). FLOW ATTENUATOR FOR USE WITH LIQUID COOLED LASER MIRRORS.
SN 6-281,148 (4,422,344). LOAD PROPORTIONAL ANTIBACKLASH GEAR DRIVE SYSTEM.
SN 6-291,863 (4,418,716). TWO-WAY FLOW VALVE.
SN 6-295,034 (4,420,755). TELEMETRY LOAD LINK ASSEMBLY.
SN 6-311,378 (4,419,595). ANALOG OR GATE CIRCUIT.
SN 6-318,652 (4,418,531). FLAMEHOLDER STABILIZATION PLATE FOR AN AIRCRAFT ENGINE AFTERBURNER SYSTEM.
SN 6-324,342 (4,420,914). SPHERICAL SEGMENT EDGE ATTACHMENT.
SN 6-343,033 (4,423,260). METHOD FOR INTRODUCING FLUORINE INTO AN AROMATIC RING.
SN 6-350,494 (4,419,285). AZIDO FLUORODINITRO AMINES.
SN 6-353,984 (4,420,932). PRESSURE CONTROL SYSTEM FOR CONVERGENT-DIVERGENT EXHAUST NOZZLE.
SN 6-356,573 (4,420,650). WEDGED CHANNEL VERTICAL JUNCTION SILICON SOLAR CELL.
SN 6-370,235 (4,419,286). AZIDO ESTERS.
SN 6-413,295. FIBER OPTIC CABLE CONNECTOR.
SN 6-511,592. OPTICAL ELECTROMAGNETIC RADIATION DETECTOR.
SN 6-547,608. SEMI- TWO-DIMENSIONAL DECOYS.
SN 6-549,532. HIGH VOLTAGE GROUNDING DEVICE FOR PRESSURIZED EQUIPMENT.
SN 6-552,552. POLYARAMATIC ETHER-SULFONE-KEYTONES WITH FLURO-SUBSTITUTED-P-CYCLOPHANE UNITS AS CROSS-LINKING SITES.
SN 6-556,861. DYNAMIC BAR PATTERN APPARATUS AND METHOD.
SN 6-559,168. HAND OFF INTEGRATOR APPARATUS FOR SIGNAL DETECTION.
SN 6-559,169. SOLAR ROCKET ABSORBER.
SN 6-559,170. LOW SHEAR NICKEL ELECTRODE.
SN 6-559,561. NARROW PULSEWIDTH PULSE GENERATOR CIRCUIT UTILIZING NPN MICROWAVE TRANSISTORS.
SN 6-559,611. MULTIPLEXED DATA STREAM MONITOR.
SN 6-559,613. PHASE-CONJUGATE RESONATOR WITH A DOUBLE SBS MIRROR.

DEPARTMENT OF THE ARMY

SN 6-246,984 (4,415,565). SILVER METACHLORIDINE IN TREATMENT OF INFECTIONS.

SN 6-359,012 (4,416,872). TREATMENT OF MALARIA WITH LIPOSOMES CONTAINING 8-AMINOQUINOLINE DERIVATIVES AND GLYCOCONJUGATES.

SN 6-571,301. DIGITAL PULSE POSITION MODULATION COMMUNICATIONS SYSTEM WITH THRESHOLD EXTENSION.

SN 6-572,350. DIELECTRIC WAVEGUIDE BANDPASS APPARATUS.

SN 6-573,546. ELECTRON BEAM PERIPHERAL PATTERNING OF INTEGRATED CIRCUITS.

SN 6-573,547. MEASUREMENT OF PROXIMITY EFFECTS IN ELECTRON BEAM LITHOGRAPHY.

SN 6-575,245. PROTECTION OF RADIATION DETECTORS FROM FAST NEUTRON DAMAGE.

SN 6-575,973. WHIP ANTENNA HIGH VOLTAGE PROTECTION DEVICE.

NATIONAL SECURITY AGENCY

SN 6-153,984 (4,429,180). APPARATUS FOR SIMULTANEOUS GENERATION OF KEY AT TWO LOCATIONS.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 3, 1984

D. 271,615	4,396,920	4,407,650	4,415,965
4,108,507	4,397,970	4,407,692	4,416,037
4,302,483	4,398,552	4,407,828	4,416,729
4,305,249	4,400,179	4,408,199	4,416,821
4,320,970	4,400,340	4,408,472	4,417,098
4,343,797	4,400,379	4,408,475	4,417,527
4,345,368	4,400,644	4,408,751	4,417,754
4,351,684	4,400,743	4,409,613	4,418,017
4,354,199	4,401,500	4,410,321	4,418,059
4,356,634	4,402,236	4,410,944	4,419,234
4,362,751	4,402,880	4,410,958	4,419,383
4,366,131	4,403,177	4,410,983	4,419,734
4,366,632	4,403,194	4,411,274	4,420,494
4,367,074	4,403,259	4,411,662	4,420,975
4,375,816	4,403,339	4,412,040	4,421,034
4,375,985	4,403,782	4,412,845	4,421,214
4,376,465	4,404,400	4,413,642	4,421,784
4,385,106	4,404,464	4,414,118	4,422,222
4,386,263	4,404,467	4,414,422	4,422,436
4,387,246	4,404,703	4,414,622	4,422,520
4,388,189	4,405,206	4,414,705	4,422,864
4,392,533	4,405,809	4,415,280	4,423,387
4,393,966	4,406,193	4,415,434	4,423,881
4,395,266	4,407,276	4,415,582	4,424,210
4,395,640	4,407,349	4,415,703	4,428,012

Disclaimers

4,111,272.—*Ronald J. Ricciardi,* Garfield; *Angelo Ferrara,* Fairfield; *Joseph L. Hartmann,* West Caldwell and *Gary R. Lauterbach,* Livingston, N.J. WEIGH FEEDING APPARATUS. Patent dated Sept. 5, 1978. Disclaimer filed Jan. 16, 1984, by the assignee, *Acrison, Inc.*

The term of this patent subsequent to Oct. 18, 1994 has been disclaimed.

4,210,963.—*Ronald J. Ricciardi,* Garfield; *Angelo Ferrara,* Fairfield and *Joseph L. Hartmann,* West Caldwell, N.J. WEIGH FEEDER SYSTEM. Patent dated July 1, 1980. Disclaimer filed Jan. 16, 1984, by the assignee, *Acrison, Inc.*

The term of this patent subsequent to Oct. 18, 1994 has been disclaimed.

4,301,510.—*Ronald J. Ricciardi,* Garfield; *Angelo Ferrara,* Fairfield and *Joseph L. Hartmann,* West Caldwell, N.J. WEIGH FEEDER SYSTEM. Patent dated Nov. 17, 1981. Disclaimer filed Jan. 16, 1984, by the assignee, *Acrison, Inc.*

The term of this patent subsequent to Oct. 18, 1994 has been disclaimed.

4,320,855.—*Ronald J. Ricciardi,* Garfield; *Angelo Ferrara,* Fairfield; *Joseph L. Hartmann,* West Caldwell and *Gary R. Lauterbach,* Livingston, N.J. WEIGH FEEDING APPARATUS. Patent dated Mar. 23, 1982. Disclaimer filed Jan. 16, 1984, by the assignee, *Acrison, Inc.*

The term of this patent subsequent to Oct. 18, 1994 has been disclaimed.

4,390,582.—*Robert C. Pickens, Jr.,* Gurnee; *Reese R. Thomas,* Libertyville and *John W. Ellicson,* McHenry, Ill. CUT PILE FABRIC WITH CARRIER AND TEXTURIZED LOOPS. Patent dated June 28, 1983. Disclaimer filed Feb. 2, 1984, by the assignee, *Ozite Corp.*

The term of this patent subsequent to June 21, 2000 has been disclaimed.

Disclaimer and Dedication

4,352,599.—*Riley Goldsmith,* Houston, Tex. PERMANENT MOORING OF TENSION LEG PLATFORMS. Patent dated Oct. 5, 1982. Disclaimer and Dedication filed Jan. 9, 1984, by the assignee, *Conoco Inc.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

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The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
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	Springfield: Illinois State Library	(217) 782-5430
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Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 704-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 3, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director 10-28-82
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electrc Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.

GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director 5-12-76
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.

HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director 1-05-83
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.

COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director 7-26-82
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.

SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—
R. F. WHITE, Director 1-16-76
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director 3-22-82
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.

SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director 6-01-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.

INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director 7-06-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.

RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—
G. M. FORLENZA, Director 6-18-82
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.

ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director 9-30-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.

DESIGN, GROUP 290—KENNETH L. CAGE, Director 1-14-71
Industrial Arts; Household, Personal and Fine Arts.

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director 3-16-82
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.

MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director 6-30-82
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.

AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—
R. E. AEGERTER, Director 11-04-76
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.

HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director 11-20-81
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.

GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—
A. L. SMITH, Director 7-23-81
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.

Expiration of patents: The patents within the range of numbers indicated below expire during March 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,307,200 to 3,311,920, inclusive
Plant Patents ..... Numbers 2,723 to 2,729 inclusive

REEXAMINATIONS

APRIL 3, 1984

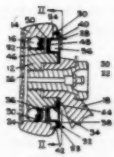
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,537,725 (187th)

TROUGH-LIKE SEAL FOR ROLLER ASSEMBLY

Ruben E. Frost, Grand Rapids, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Reexamination Request No. 90/000,341, Mar. 10, 1983.
Reexamination Certificate for Patent No. 3,537,725, issued Nov. 3, 1970, Ser. No. 773,490, Nov. 5, 1968.
Filed Mar. 10, 1983, Ser. No. 773,490
Int. Cl.³ F16C *33/80*
U.S. Cl. 308—187.2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–13** is confirmed.

1. In a roller bearing assembly comprising an outer race, an inner race, bearing means between said outer and inner race, and means axially sealing said bearing means between said outer and inner race to retain lubrication at said bearings between said outer and inner race and to exclude dirt and moisture from said bearings, the improvement in said axial sealing means comprising:

an outer radial sealing ring fixed to said inner race and having an outer radial edge extending in close proximity to said outer race;

an intermediate sealing ring fixed to said inner race and axially spaced from said outer sealing ring so as to form a first trough therebetween for collection of water and dirt;

said intermediate sealing ring having a radial outer edge just short of an inner diameter of said outer race;

an inner sealing ring fixed to said outer race and having a depending annular flange extending toward said inner race and spaced axially inwardly of said intermediate sealing ring in substantial overlapping relationship with said intermediate sealing ring, said inner sealing ring having an axial ring portion in engagement with said outer race extending axially outwardly of said depending annular flange and axially outwardly of said intermediate sealing ring short of said outer radial sealing ring, an outer portion of said axial ring extending from said outer race to repel foreign matter outwardly of said bearings.

B1 4,048,780 (188th)

METHOD AND APPARATUS FOR PLACING OBJECTS INTO BOXES

Alexis Chenevard, Morges, Switzerland, assignor to SAPAL Societe Anonyme des Plieuses Automatiques, Switzerland

Reexamination Request No. 90/000,317, Jan. 17, 1983.
Reexamination Certificate for Patent No. 4,048,780, issued Sep. 20, 1977, Ser. No. 718,563, Aug. 30, 1976.
Filed Jan. 17, 1983, Ser. No. 718,563
Claims priority, application Switzerland, Oct. 27, 1975, 13901/75
Int. Cl.³ B65B *5/08, 35/38*
U.S. Cl. 53—448

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

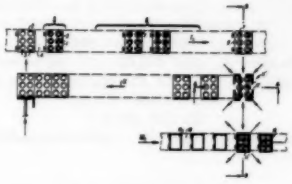
Claims **1, 3, 5** and **7**, having been finally determined to be unpatentable, are cancelled.

Claims **4, 6,** and **8** are determined to be patentable as amended:

Claims **9–11**, dependent on amended claims, are determined to be patentable.

New claims **12–18** are added and determined to be patentable.

14. A method of placing sets of objects, such as assortments of chocolates, in boxes, comprising disposing a set of objects in a template, conveying the objects disposed in the template to a table, holding the objects on the table by suction, removing the template, bringing separated mobile wall sections about the objects held on the table, moving the wall sections together against the objects to form a frame around the objects and to bring the objects together into a pattern having a perimeter that defines an area slightly smaller than the surface area of the bottom of a box which is to receive the objects, and gripping and conveying the thus assembled set of objects and depositing the set of objects in the box; said gripping, conveying and depositing step comprising applying suction to the objects from above simultaneously with the movement of



the wall sections, moving the assembly of wall sections and objects held by suction above a box arriving at a filling station of a conveyor, and discharging the set of objects into the box by opening the frame and interrupting the suction.

16. Apparatus for placing sets of objects, such as assortments of chocolates, in boxes, comprising templates each adapted to receive a set of objects to be placed in a box, pneumatic means for holding the objects by suction on a table, means for cyclically moving the templates to each deposit a set of objects on the table and remove the template from the deposited objects, separate mobile wall sections adapted to be brought about a set of objects held on the table and moved against the objects to form a frame around the objects and to bring the objects together into a pattern having a perimeter that defines an area slightly smaller than the surface area of the bottom of a box which is to receive the objects, means for conveying the walls together to form a frame around the set of objects, and means for gripping and conveying the assembled set of objects and the walls as one assembly and depositing the set of objects in one operation in a box; said means for gripping, conveying and depositing comprising a suction head cooperating with the mobile wall sections when they are brought together into a closed frame to form a suction bell which lifts up the set of objects in the frame.

DEFENSIVE PUBLICATIONS

PUBLISHED APRIL 3, 1984

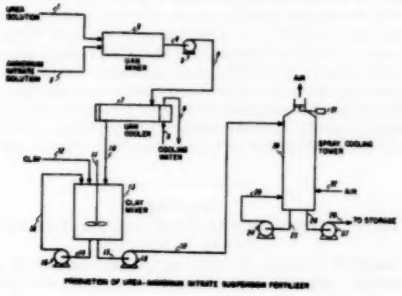
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T104,101
PRODUCTION OF UREA-AMMONIUM NITRATE SUSPENSION FERTILIZER

Jeffrey L. Boles, 3550 Helton Dr., A-3, Florence, Ala. 35630, and Thomas M. Jones, 208 Stephenson Ct., Sheffield, Ala. 35660

Filed Dec. 10, 1982, Ser. No. 448,568
Int. Cl.³ C05C *9/00*
U.S. Cl. 71—30
5 Sheets Drawing. 29 Pages Specification

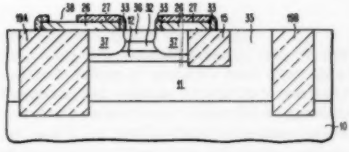


Highly concentrated nitrogen suspension fertilizers which have excellent long-term storage and handling properties in both warm and severely cold weather are produced from urea, ammonium nitrate, water, and attapulgite clay and contain urea crystals suspended in a saturated solution containing urea and ammonium nitrate. The compositions must be maintained within a very narrow range to produce suspensions satisfactory for commercial use. This narrow composition range is such that the saturation temperatures and nitrogen contents of the products fall within specific ranges. Deviation from these ranges results in poor quality, commercially unusable products. If the saturation temperature or nitrogen content is too high, the product is too viscous to be pumped or applied to the soil. If the saturation temperature is too low, the product contains excessively large crystals which settle to the bottom of storage and shipping tanks and clog spray nozzles in suspension application equipment. The process consists of first heating the urea, ammonium nitrate, and water to an all solution state or combining hot urea and ammonium nitrate solutions from production. Then the solution is cooled in two or more stages with gelling-type clay added prior to crystallization and air cooling used in the crystallization stage(s).

T104,102
POLYSILICON-BASE SELF-ALIGNED BIPOLAR TRANSISTOR PROCESS AND STRUCTURE

Allen P. Ho, 2 High Point Dr., Poughkeepsie, N.Y. 12603, and Cheng T. Horng, 6396 Gondola Way, San Jose, Calif. 95120

Continuation of Ser. No. 133,155, Mar. 24, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,897
Int. Cl.³ H01L *27/04*
U.S. Cl. 357—50
5 Sheets Drawing. 33 Pages Specification



A bipolar transistor isolated by deep recessed oxide **19**, with shallow recessed oxide **15** separating the base **32**, **37** from collector contact **35**, with polysilicon contact **26** to base extrinsic region **37**, the polysilicon being self-aligned with the emitter **36** and the emitter contact.

REISSUES

APRIL 3, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

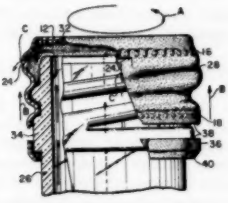
Re. 31,546
ANTI-MISSILING BOTTLE CLOSURE

Rocco D. Walker, Hazelton, Pa., assignor to Zapata Industries, Inc., Frackville, Pa.

Original No. 4,007,851, dated Feb. 15, 1977, Ser. No. 576,206, May 9, 1975. Application for reissue Jan. 26, 1983, Ser. No. 461,170

Int. Cl.³ B65D *51/16*

U.S. Cl. 215—307 **29 Claims**



1. An improved closure of the type having a shell with integral top and side walls, a knurl region adjacent to the top wall, and with rolled-on threads provided on the side wall for engagement with the threaded neck of a bottle to contain pressurized fluids, the threads being limited to about 1¼ turns, the improvement comprising means including venting openings in said side wall contiguous to the knurl region *and above the area of the rolled-on thread* for releasing the pressure within said closure sufficiently to prevent missiling of the closure when the closure is initially turned to unthread it from the bottle.

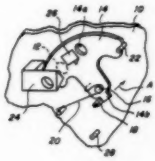
Re. 31,547
EXPOSURE CONTROL MECHANISM FOR USE WITH CHEMICAL FLASH

James W. Meyer, Fairport, and John E. Mooney, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 4,349,259, dated Sep. 14, 1982, Ser. No. 300,362, Sep. 8, 1981. Application for reissue Jun. 10, 1983, Ser. No. 502,910

Int. Cl.³ G03B *15/03, 9/26*

U.S. Cl. 354—135 **6 Claims**



5. In a photographic camera of the type adapted for use with chemical flash lamps, an exposure control mechanism for effecting an exposure in synchronism with the peak intensity of a flash-lamp, comprising:

(a) means for defining an exposure aperture;

(b) shutter release means actuatable by a camera operator for initiating an exposure;

(c) flash firing means for igniting a chemical flash lamp in response to actuation of said shutter release means; and

(d) shutter means responsive to actuation of said shutter release means for moving in a first direction with respect to said exposure aperture, while covering said aperture to effect a delay following flash ignition, and for moving in a second direction opposite to said first direction to uncover and cover said exposure aperture to effect an exposure in synchronism with said peak flash output.

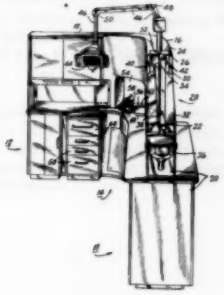
Re. 31,548
DENTAL OPERATORY SYSTEM

Tony Watanabe, Redondo Beach, Calif., assignor to Takara Company, New York, Inc., Somerset, N.J.

Original No. 4,332,557, dated Jun. 1, 1982, Ser. No. 199,516, Oct. 22, 1980. Continuation-in-part of Ser. No. 122,565, Feb. 19, 1980, abandoned. Application for reissue Feb. 7, 1983, Ser. No. 465,433

Int. Cl.³ A61C *1/14*

U.S. Cl. 433—77 **35 Claims**



1. A dental operatory system comprising:

a generally L-shaped first dental operatory unit, wherein the inside of the L defines an operatory work space for a first dental operator, and wherein the outside of one leg of the L provides an operatory work space for a second dental operator, said L leg outside comprising dental operatory implements for dental operations, and means to mount said implements for accessing into said second operatory work space for use by said second dental operator, said unit further comprising dental operatory means said dental operatory means comprising an X-ray unit, and means to mount said X-ray unit on said one leg of the L-shaped unit, and means to permit alternative use of said X-ray unit by said operators in the respective operatory work spaces, and further comprising an X-ray operatory control unit, and means to mount said X-ray operatory control unit on the outside of the other leg of the L-shaped unit for use by the operators, and whereby a generally L-shaped second dental operatory unit, is spacedly positionable from and in registration with and performing the dental operatory functions as in said first unit with said one leg of said second L-shaped unit being substantially parallel to one leg of said first L-shaped unit, and the other leg of said second L-shaped unit being aligned substantially along a common rectilinear axis and in tandem with the other leg of said first L-shaped unit, so that L-shaped units may be incrementally added in registration with one another.

PLANT PATENTS

GRANTED APRIL 3, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,213

ROSE CV. CLIMBING OLE'

George S. Haight, San Jose, and Herbert C. Swim, Ontario, both of Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jul. 13, 1982, Ser. No. 397,923
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—6 **1 Claim**

1. A new and distinct variety of rose as a sport of the rose cv. Olé (U.S. Plant Pat. No. 2,474) characterized in that it is a climber and flowers on second season's wood, with a large flowering flush in the spring followed by intermittent flowering during the remainder of the growing season and otherwise having the characteristics of the parent rose cv. Olé.

5,214

CUPHEA PLANT TABLE TOP BONSAI

Clifton F. Pottberg, P.O. Box 5130, Hudson, Fla. 33567

Filed Sep. 28, 1982, Ser. No. 425,932
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of Cuphea plant substantially as herein described, characterized particularly as to novelty by its compact size, internodal dwarfing, and spreading growth form.

5,215

***RAPHIOLEPIS INDICA* CV. MONREY**

William B. Usrey, Glendora, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Aug. 17, 1982, Ser. No. 408,938
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct selection of *Raphiolepis indica* referred to as *Raphiolepis indica* cv. Monrey as substantially shown and described herein, which is characterized by a loose open habit; a larger, looser and broader inflorescence; single flowers; and rich dark pink flowers.

PATENTS

GRANTED APR. 3, 1984

ERRATA

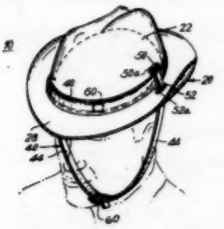
For CLASS	See PATENT NO.
162–086	4,439,888
171–001	4,439,891
175–002	4,439,892
177–002	4,439,893
128–079	4,440,183
502–053	4,440,667
502–331	4,440,668
524–177	4,440,674
549–292	4,440,927
585–260	4,440,956
585–323	4,440,957
560–247	4,440,958
524–177	4,440,974

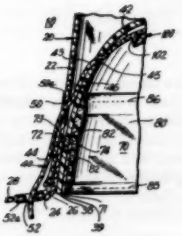
PATENTS

GRANTED APRIL 3, 1984

GENERAL AND MECHANICAL

4,439,871
HEAD PROTECTING HEADWEAR
Mario A. Plastino, 659 Mastic Rd., Mastic, Long Island, N.Y. 11950
Filed Apr. 19, 1982, Ser. No. 369,646
Int. Cl.³ A42B *3/00*
U.S. Cl. 2—422 **16 Claims**



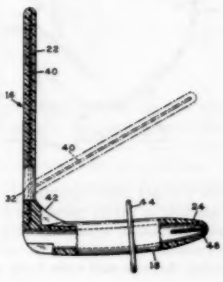


1. Headwear for protecting the head of a wearer comprising an outer head covering having a crown portion, an integral bottom peripheral edge defining a shell receiving opening, and a brim extending outwardly and peripherally from the crown portion, a protective rigid impact resistant shell removably disposed within said head covering, said protective shell having a protective crown portion with interior and exterior surfaces, and an integral bottom rim defining a generally circular head receiving opening, and means for removably securing said protective shell in conforming engagement with said outer head covering, said securing means including a strap having exterior sections which extend from the exterior surface of said protective shell, and strap receiving openings in the crown portion of the outer head covering and in said peripherally extending brim of said outer head covering, said exterior strap sections extending through said strap receiving openings of said outer head covering to secure said protective shell in engagement with said head covering.

4,439,872
APPARATUS TO ASSIST ESOPHAGEAL SPEECH
Julian L. Henley-Cohn, New Haven, Conn., and Eugene R. Jakubczak, Bay City, Mich., assignors to Wright Manufacturing Company, Arlington, Tenn.
Filed Oct. 6, 1981, Ser. No. 309,097
Int. Cl.³ A61F *1/20*
U.S. Cl. 3—1.3 **6 Claims**

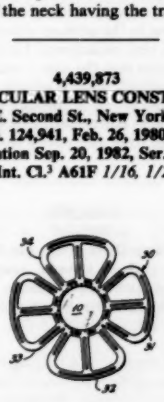
1. A prosthesis to assist esophageal speech in a laryngectomee having a tracheostome and a tracheal-esophageal fistula comprising:

(a) an elastomeric bio-compatible silicone rubber air tube with an open tracheal end and a normally closed esophageal end having an elliptical cross section with major and minor axes and a one-way slit valve located along the plane of said major axis at the esophageal end of said tube, the elliptical cross section of that portion of the tube containing the slit valve being progressively tapered downwardly in size between the section containing the end of the slit valve nearest the tracheal end and the section containing the end of the slit valve at the esophageal end of said tube, and the ratio of the lengths of the major and minor axes of said elliptical cross section being between 1.5 to 1 and 3 to 1;



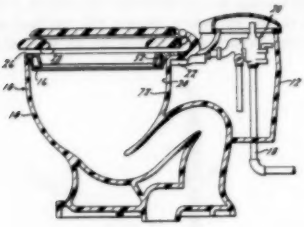
(b) a flange formed in a plane extending generally perpendicularly from said air tube adapted to occupy a sufficiently small portion of said plane so as to have a surface which lies on an external portion of the neck without covering the portion of the neck having the tracheostome.

4,439,873
INTRA-OCULAR LENS CONSTRUCTION
Stanley Poler, 78 E. Second St., New York, N.Y. 10003
Division of Ser. No. 124,941, Feb. 26, 1980, Pat. No. 4,377,329.
This application Sep. 20, 1982, Ser. No. 420,106
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **3 Claims**



1. An intra-ocular lens assembly, comprising an optically finished glass lens element and haptic structure engaged to and surrounding said lens element, said haptic structure comprising two sheet-like elements of plastic material having at least peripherally continuous engagement with the respective anterior and posterior sides of the rim of said lens element, said sheet-like elements being in circumferentially continuous bonded lamination to each other radially outside said lens element, said bonded lamination being permanent and resistant to separation and establishing a circumferentially continuous region of lens-rim support, and said haptic structure being fenestrated radially outside said region and including anterior-chamber engageable formations radially outside said lens element.

4,439,874
WATER CLOSET RIM AND VENTING PROCESS THEREFOR
Donald C. Schrock, Carmel, Ind., assignor to Masco Corporation of Indiana, Taylor, Mich.
Filed Sep. 7, 1982, Ser. No. 415,355
Int. Cl.³ E03D *3/00*
U.S. Cl. 4—300 **19 Claims**



1. A rim for a water closet having a bowl and flush means selectively operable to supply pressurized water to a rim, said rim comprising an annular main body adapted for interconnection in a horizontal orientation with said bowl, an annular cavity extending through said main body and having a downstream portion and an upstream portion, said flush means supplying pressurized water to said upstream portion of said annular cavity and directing the water towards said downstream portion of said annular cavity, a series of perforations in said rim in communication with said annular cavity whereby pressurized water supplied by said flush means to said annular cavity may exit said annular cavity and enter said bowl, and a venting passageway located in said downstream portion of said annular cavity and provided with an inlet and an outlet, said inlet being open to an upper portion of said annular cavity and said outlet being open to the ambient atmosphere at a location below the inlet, said vent passageway having a cross-sectional area substantially larger than the area of each said perforations;

whereby, as pressurized water is selectively supplied to said annular cavity and forces air through said cavity from said upstream portion to said downstream portion, a portion of said air is vented from said cavity through said vent passageway.

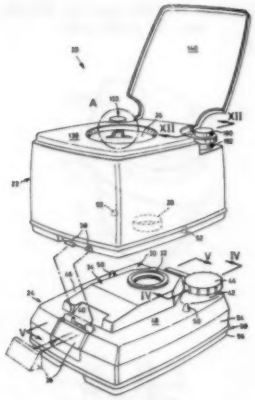
4,439,875
TOILET
John M. Stewart, River Drive Park, and Clifford B. Hewson, West Vancouver, both of Canada, assignors to Sanitation Equipment Limited, Downsview, Canada
Filed Jun. 2, 1981, Ser. No. 269,434
Int. Cl.³ E03D *5/012*
U.S. Cl. 4—321 **16 Claims**

1. A toilet of the type having a holding tank for waste material, a bowl communicating with a waste material inlet of said tank, and valve means normally closing said inlet and adapted to be opened to permit waste material to enter the tank from said bowl, wherein said holding tank inlet is provided with a seal defining an annular sealing surface disposed in a sealing plane within said tank, and wherein said valve means comprises:

a valve member which is movable between open and closed positions, the valve member being disposed laterally of said inlet in said open position and having a sealing surface adapted to cooperate with said seal in said plane when the valve member is in said closed

means supporting said valve member for movement (a) between said open position and an intermediate position in which the valve member is disposed below said inlet preparatory to sealing the same while remaining below said sealing plane, and (b) generally normal to said sealing plane between said intermediate position and said closed position;

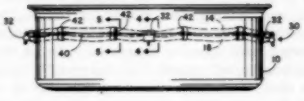
actuating means coupled to said valve member and operable from externally of the toilet to move the valve member between said open position and said intermediate position and between said intermediate position and said closed position;



whereby the valve member moves with respect to said annular sealing surface in directions generally normal to said sealing plane for minimizing abrasion of said seal;

and wherein the toilet further comprises a wiper element disposed adjacent said holding tank inlet and positioned to exert a wiping action on said sealing surface of the valve member as the member moves between said open position and said intermediate position.

4,439,876
CLAMP ASSEMBLY FOR FLEXIBLE PIPE INSTALLATIONS PRIMARILY FOR THERAPY BATHS
Philip E. Chalberg, 119 Maple Ave., Orange, Calif. 92668
Filed Jan. 4, 1982, Ser. No. 336,760
Int. Cl.³ A61H *33/02*
U.S. Cl. 4—542 **5 Claims**



1. An improved whirlpool jet assembly, the assembly of the type having a plurality of Venturi jets, each such jet having a flange for compressive engagement with the outside surface of a tub wall coaxially with an aperture through the tub wall, a Venturi mixing chamber terminating in the flange and configured for generating an aerated jet of water into the tub, and parallel water and air inlets communicating with the mixing chamber for providing the water and air; the improvement comprising:

a plurality of retainer brackets, one such bracket integrally affixed to each of said jets, each of said brackets having a C-shaped member for receiving an elongated rod,

at least one elongated rod shaped to substantially conform to the outer peripheral surface of said tub wall along at least a portion thereof, and

a plurality of primary pipe support brackets each having an outwardly facing C-shaped member for attachment to said rod and a pair of inwardly facing C-shaped members for

receiving a pair of parallel flexible pipes, one such pipe for interconnecting the air inlets of respective jets and the other such pipe for interconnecting the water inlets of respective jets,

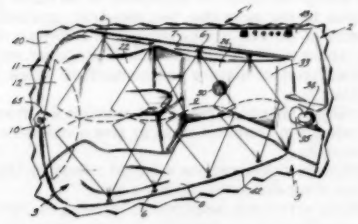
at least one such primary support bracket being located between each two of said jets whereby to support said flexible pipes around the periphery of said tub wall intermediate of said jets and adjacent said tub wall.

4,439,877

SHOWER ARRANGEMENT FOR BATHING UNITS

Raymond T. Houle, Traverse, Mich., assignor to Silchor, Traverse, Mich.

Filed Mar. 26, 1982, Ser. No. 362,485
Int. Cl.³ A47K 3/22
U.S. Cl. 4—596 **33 Claims**



1. A bathing apparatus, comprising:

a bathtub having opposite side and end walls, a raised seat portion, a back portion, and a foot portion; said seat, back and foot portions having an anatomical contour which forms a chair shape for supporting an invalid in a seated position in the bathtub, said bathtub having a lateral opening in one of said sidewalls with sufficient size to permit ingress and egress therethrough;

a door selectively closing said bathtub opening;

a plurality of nozzles mounted on the sidewalls of said bathtub, and being spaced apart and mutually oriented to cover the seated invalid;

at least one of said nozzles being mounted in said door; and

means for communicating said one nozzle with a source of pressurized water when said door is in a closed position, comprising:

a first fitting connected with said bathtub, and communicating with one of said one nozzle and said source of pressurized water; and

a second fitting shaped for mating engagement with said first fitting, and communicating with the other of said one nozzle and said source of pressurized water; said second fitting being mounted on said door and translating therewith, and being positioned in alignment with said first fitting in the closed door position;

means for converging said first and second fittings into sealing engagement during the closed door position to selectively communicate said source of pressurized water with said one nozzle.

4,439,878

SOFA SLEEPER WITH SEAT ADJUSTMENT MECHANISM

John E. Stevens, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Apr. 22, 1982, Ser. No. 370,976
Int. Cl.³ A17C 17/04
U.S. Cl. 5—29 **8 Claims**

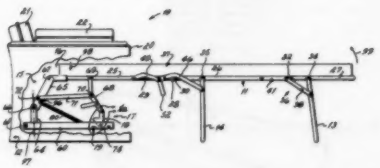
1. A sofa sleeper comprising

a sofa frame,

a bed frame having at least a head frame section and a foot frame section, said sections being foldable relative one to the other between an extended bed position and a folded up sofa position,

a base plate fixedly connected to said sofa frame,

a collapsible frame support linkage, said support linkage being connected to said bed frame and to said sofa frame, said linkage functioning to extend said bed frame from sofa position, and to retract said bed frame into sofa position, with said sofa frame,



said support linkage including a styling link and

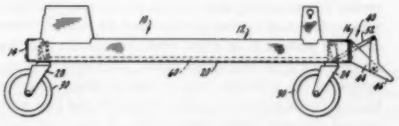
a styling bolt threadedly mounted on said base plate and engageable with said styling link, said styling bolt being adjustable between plural styling positions, the pitch of the seat plane defined by the folded up bed frame when in the sofa position being increased or decreased in response to adjustment of said styling bolt.

4,439,879

ADJUSTABLE BED WITH IMPROVED CASTOR CONTROL ASSEMBLY

Lester W. Werner, St. Louis, Mo., assignor to B-W Health Products, Inc., Maryland Heights, Mo.

Filed Dec. 1, 1980, Ser. No. 211,542
Int. Cl.³ A61G 7/00
U.S. Cl. 5—60 **3 Claims**



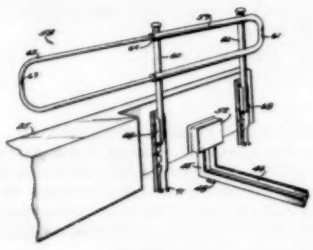
1. In an adjustable hospital bed having head, foot and side members, a plurality of cam-operated castors supporting said members, and an assembly for controlling operation of said castors; the improvement wherein said assembly comprises an actuator movable selectively to swivel, locking and steering positions, said actuator being a pedal pivotably supported adjacent said foot member, whereby the castors may be selectively actuated from a control station at the foot of the bed, a linkage mechanism having rigid elements operatively engaged with said actuator and at least two of said castors and including a series of links, connecting rods and rotatable shafts, at least one of said castors including a first cam for operation thereof selectively by a first rotatable shaft to swivel, locking and steering modes in response to movement of said actuator to its swivel, locking and steering positions, and at least one other of said castors including a second cam for operation thereof selectively by a second rotatable shaft to swivel and locking modes in response to movement of said actuator to its swivel and locking positions and retention thereof in said swivel mode in response to movement of said actuator to its steering position, said one castor supporting a corner of the bed formed by said foot member and a side member, and said other castor supporting a corner of the bed formed by said head member and a side member, said corners being diagonally opposed.

4,439,880

GERIATRIC BED CONSTRUCTION WITH SIDEGUARDS

Joseph A. Koncelik, Worthington; David B. Chaney, Powell, both of Ohio; Walter G. Lockard, and Thomas D. Hontz, both of Quakertown, Pa., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Sep. 18, 1980, Ser. No. 188,472
Int. Cl.³ A47C 21/08
U.S. Cl. 5—429 10 Claims



1. An assembly for use with a mattress having a frame for supporting it above the ground so that it is generally horizontal; said assembly comprising:

rail means for preventing one on the mattress from rolling off the mattress, said rail means comprising a rail structure extending along at least one side of the mattress, and said rail structure including a first portion extending a first distance along the length of the mattress; a second portion; means for mounting said second portion on said first portion so that said second portion may be moved relative to said first portion from a first position wherein said first and second portions are substantially coextensive along the length of the mattress, to a second position wherein said second portion extends outwardly from said first portion a second distance along the length of said mattress, said second distance being less than the length of said mattress; and means for mounting said first portion at the head of the mattress so that said second portion moves from the head of the mattress towards the foot of the mattress, said second portion being solely supported by said first portion irrespective of the position of said second portion with respect to said mattress;

means for mounting said rail means first portion for vertical movement with respect to the mattress so that it can move from a position above the mattress, performing its roll-off preventing function, to a position below the top of the mattress wherin it does not restrict entry to and exit from the mattress; and

said rail mounting means comprising a pair of vertically extending supports stationarily mounted with respect to said frame; a pair of vertically elongated rods, one received by each of said supports; cooperating locking means formed on said rods and said supports for providing interlocking of a said rod with a said support in at least one position wherein said rail means first portion extends above said mattress; and actuator means for effecting relative movement between said rods and said supports so that said rods do not interlock with said supports so that said rods may be vertically moved with respect to said supports.

4,439,881

PROCESS FOR THE CONTINUOUS UNIFORM APPLICATION OF DYE LIQUORS TO WET TEXTILE FABRIC WEBS

Hans-Ulrich von der Eltz, Frankfurt am Main, and Peter Oppitz, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,876
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3037156
Int. Cl.³ D06B 23/26
U.S. Cl. 8—151 12 Claims

1. A process for continuous uniform application of aqueous dye liquor to a water-wet textile fabric web, whose moisture content is measured, in the longitudinal and in the transverse direction with respect to the passage of the fabric, by microwave absorption before the application of the liquor, with an apparatus having more than two measuring positions across the width of the web, and by microwave absorption with the same apparatus after the application of the liquor, such measurement being continuous and contactfree, which process comprises

partially dewatering a fabric web which is wet from a preceding wet treatment so as to give a residual moisture content,

continuously measuring the achieved residual moisture content along and across the fabric web,

with the aid of such measurement adjusting the dewatering operation to compensate for deviation from the uniformity of that dewatering,

applying an aqueous dye liquor to the partially dewatered fabric web without intermediate drying, the amount of said liquor to be applied uniformly as a function of the measured values of the residual moisture content obtained in connection with dewatering,

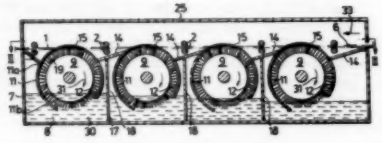
measuring the moisture content of the liquorcarrying fabric web by microwave absorption as defined above, and based on such measurement of the total moisture content, and on the measurement of the residual moisture content made in connection with dewatering, adjusting liquor application to compensate for deviation from uniformity in said application.

4,439,882

DEVICE FOR CLEANING OBJECTS BY SCRUBBING IN THE PRESENCE OF SOLVENT

Kurt A. Holm, Skoghall, Sweden, assignor to Bycasin AB, Karlstad, Sweden

Filed May 17, 1982, Ser. No. 379,031
Int. Cl.³ B08B 1/02
U.S. Cl. 15—77 7 Claims



1. Device for cleaning objects by scrubbing in the presence of solvent, comprising: a conveyor path (1) for the objects; means (2–5) for driving the objects along the conveyor path; a vessel (7) containing solvent; at least two roller brushes (9), rotatably mounted in the vessel, which are arranged essentially horizontally with their axes transverse to the direction of the conveyor path (1) and which are partially immersed in the solvent, the conveyor path being in contact with the upper peripheral portion of each brush; means (20–22) for rotating the brushes; and a first plate which is conjoined to the contour of the upwardly moving peripheral portion of each rotating

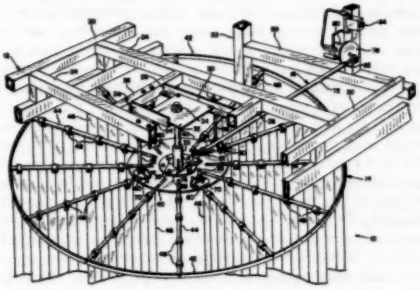
brush (9); the lower portion (11*b*) of the first plate (11) extending down into the solvent so that a brush, in cooperation with the first plate (11), during rotation pumps up solvent to the area of contact between the conveyor path and the brush, characterized in that a cover (14–16) is sealingly joined to the walls of the vessel (7); that the cover has an opening for each brush (9); and that the edge of each opening is in sealing association with the first plate, the downwardly moving peripheral portion of the rotating brush (9) and the end portions of the brush, whereby each brush forms a seal for its opening in the cover.

4,439,883

VEHICLE WASHING APPARATUS

Daniel C. Hanna, 1133 SW. Rivington Dr., Portland, Oreg. 97201

Filed Oct. 28, 1982, Ser. No. 437,454
Int. Cl.³ B60S *3/04*
U.S. Cl. 15—97 B **7 Claims**



1. An apparatus for mounting downwardly depending vehicle washing means, comprising:

an elevated frame;

horizontally disposed support means for supporting the vehicle washing means, said support means being rotatably mounted to said frame about a vertical axis to permit rotational oscillation thereof;

fixed length suspension means radially offset from said axis and extending from said frame to said support means; and

means for rotatably oscillating said support means about said axis, whereby said suspension means causes said support means to vertically oscillate as said support means is being rotationally oscillated.

4,439,884

CONTAINER WITH BRISTLES FOR CLEANING INSTRUMENTS

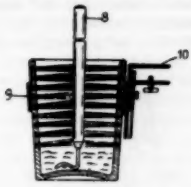
Gastone Giorni, Via L. Fatti 23, Sansepolcro/Arezzo, Italy

Filed Mar. 18, 1982, Ser. No. 359,602
Claims priority, application Italy, Apr. 7, 1981, 1211 A/81; Dec. 21, 1981, 1229 A/81
Int. Cl.³ B08B *1/00*; A46B *11/00*
U.S. Cl. 15—104.92 **12 Claims**

1. A container for cleaning slender instruments comprising:

a container housing having a substantially cylindrically shaped side wall defining an internal chamber; and

a plurality of bristle bunches removably mounted in said side wall and radially extending therefrom to converge generally toward the center of said internal chamber of said container housing, said bunches of bristles being longitudinally positioned in said side wall so as to brush against instruments inserted into said container and to maintain said instruments in an upright position, said bunches of



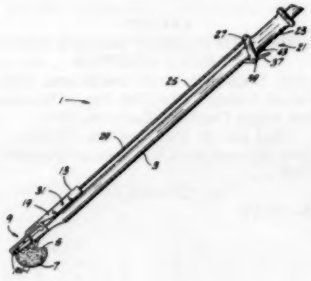
bristles having a length approximately one-half of the diameter of the container housing.

4,439,885

SPONGE MOP WITH WRINGER

Warren C. Klotz, 29 Huntington Dr., Belleville, Ill. 62223

Continuation-in-part of Ser. No. 253,774, Nov. 2, 1982, Pat No. 4,356,586. This application Jun. 21, 1982, Ser. No. 390,357
Int. Cl.³ A47L *13/146*
U.S. Cl. 15—119 A **12 Claims**



1. A mop comprising a handle, a mop head mounted at one end constituting the front end of the handle for holding a sponge or the like, a wringer for wringing the sponge comprising squeeze means mounted on the mop head for sliding movement from a retracted position in which it is disposed to permit mopping to an extended position, and for pivotal movement about a pivot axis extending in side-to-side direction with respect to the mop head from said extended position to a wringing position in which it squeezes the sponge to wring it, and actuating means comprising a hand piece mounted on the handle for movement along the handle for effecting said sliding and pivotal movement of the squeeze means.

4,439,886

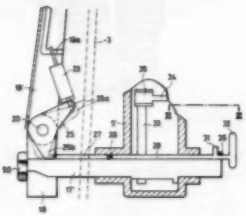
WIPER DEVICE

Akio Yagasaki, Tokyo, and Masaki Watanabe, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,692
Claims priority, application Japan, Mar. 30, 1981, 56-45419; Mar. 30, 1981, 56-45420
Int. Cl.³ B60S *1/34*
U.S. Cl. 15—250.2 **13 Claims**

1. In a wiper device for a land vehicle windshield having an operation zone over which a wiper blade is adapted to oscillate and a rest zone engageable by a wiper blade in the rest position including a wiper blade adapted to wipe said operation zone of said windshield, a wiper arm having one end pivotally supporting said wiper blade and drive means for providing oscillating

movement to said wiper arm, the improvement comprising means for selectively varying the urging force of said wiper blade against said windshield including at least one coil spring having one end connected to said wiper arm and a moveable member connected to the other end of said coil spring, said moveable member being moveable to a first position upon



energization of said drive means to increase the urging force of said spring when said wiper blade is operating in the operation zone regardless of the speed of the vehicle and being moveable to a second position upon deenergization of said drive means to decrease the urging force of said spring when said wiper blade is in the rest position in said rest zone.

4,439,887

WIPER ARM WITH WASHER NOZZLE FOR MOTOR VEHICLE WINDOWS

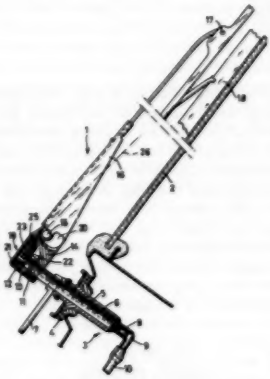
Peter Fischer, Langenfeld; Axel Rauthmann, Pulheim, and Erwin Pietryk, Cologne, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 15, 1982, Ser. No. 339,523

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1981, 3102538

Int. Cl.³ B60S 1/46

U.S. Cl. 15—250.04 **4 Claims**



1. Windscreen wiper arm with washer nozzle for vehicle windows with a fastening piece connected torsionally rigid to a hollow wiper shaft extending outwardly with respect to the window through a wiper bearing and a wiper arm connected with the wiper shaft around a swivelling axle running transverse to the wiper shaft and whereby, in a flexible plastic part covering the fastening piece, there is disposed a washer nozzle connected to the hollow wiper shaft, characterized in that the flexible plastic part is in the form of a cover (**19**) receiving the swivelling axle (**15**) of the wiper arm (**16**) and the flexible plastic part includes an internal ball cup (**21**) for receiving the outer end of the hollow wiper shaft (**6**) in close fit relationship the outer end being formed as a ball nipple (**22**).

4,439,888

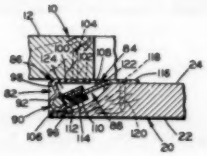
SUBSTANTIALLY CONCEALED HINGE FOR DOOR WITH RECESS

Orville D. Merillat, Adrian, Mich., assignor to Merillat Industries, Inc., Adrian, Mich.

Filed Dec. 17, 1981, Ser. No. 331,453

Int. Cl.³ E05F 1/12

U.S. Cl. 16—286 **7 Claims**



1. In combination, a hinge, a frame, and a door, said hinge being substantially concealed by said door and pivotally mounting said door on said frame, said hinge comprising a first hinge wing, a second hinge wing, and a knuckle, said first hinge wing comprising a first portion extending outwardly from said knuckle and a second portion extending at an angle to said first portion and substantially parallel to a surface of said frame, said second portion having means for receiving fasteners for attaching said second portion to said frame, said second wing comprising a third portion extending outwardly from said knuckle and forming a narrow included angle with the plane of the door and with the plane of said frame when said door is in a closed position, and a fourth portion extending outwardly from said third portion and being parallel to the inner surface of said door, said fourth portion having means for receiving fasteners for attaching said fourth portion to said door, said door having a recess in a hinge edge thereof in which at least a substantial portion of said knuckle, said first portion of said first hinge wing, and said third portion of said second hinge wing are located, said recess being of generally triangular shape as viewed in a plane perpendicular to the hinge edge of the door and transverse to the plane of the door, the bottom of said recess being concave and slanting in the same direction as said third portion of said second hinge wing, said third portion of said second hinge wing carrying a spring-load plunger urged toward said knuckle, said plunger having a hollow portion that straddles part of said third portion and having a coil spring inside the hollow portion, and said knuckle comprising a sleeve structurally integral with said first portion of said hinge wing and having a shoulder aligned with said plunger to urge the door toward a closed position when engaged by said plunger, said concave bottom of said recess being spaced from the plunger to allow movement of the plunger toward and away from said sleeve, said third portion forming a narrow included angle of ten to thirty-five degrees with the second portion of said first wing when the hinge is in the closed position.

4,439,889

STUNNING GUN

Ralph Karubian, 7100 S. Avalon Blvd., Los Angeles, Calif. 90003

Filed Jul. 19, 1982, Ser. No. 399,489

Int. Cl.³ A22B 3/02

U.S. Cl. 17—1 B **10 Claims**

1. A stunning gun having:

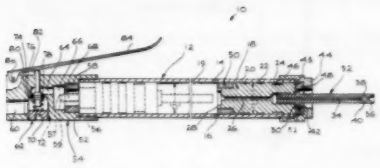
a barrel with an inner wall having a first inside diameter and with first and second ends;

a piston having a first maximum outside diameter supported coaxially within said barrel for movement therein;

said first maximum outside diameter having a magnitude such that said piston forms a slip fit with said first inside diameter of said inner wall of said barrel;

a probe fixedly and coaxially supported at the end of said

piston corresponding to said second end of said barrel and moveable with said piston;
said piston and said probe each having inter-communicating air passages therethrough;
said air passage in said probe having a coaxial portion and a communicating exhaust portion at right angles thereto;
said piston having annular recesses in the outer surface thereof and carrying on its end corresponding to said first end of said barrel a region of magnetic material;
a handle portion carried by said barrel at said first end thereof and having an air inlet aperture and intermediate and outlet chambers therein,
said intermediate chamber and said outlet chamber being intercoupled for air passage therethrough; said outlet chamber being coupled, for air passage, to said barrel;



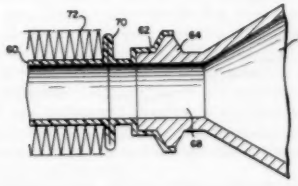
a valve assembly carried in said handle and interposed between said air inlet aperture and said intermediate chamber for control of air flow between said inlet aperture and said intermediate chamber and, consequently, for control of air into said barrel;
a magnet carried within said handle adjacent said first end of said barrel for magnetically attracting and releasably retaining said magnetic material and the piston in which it is carried in a position adjacent said first end of said barrel prior to the firing of said gun;
said inlet aperture being adapted for coupling to a source of compressed air; and,
a trigger carried by said handle and positioned to engage and actuate said valve assembly for permitting the passage of compressed air from said inlet aperture to said piston to cause motion of said piston and the probe carried thereby.

4,439,890

SYNTHETIC FOOD CASING ARTICLE EMPLOYING A RIGID HOLLOW TUBULAR CORE MEMBER WITH INTEGRAL CASING RETENTION ELEMENT

Michael P. Kazaitis, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1982, Ser. No. 454,677
Int. Cl.³ A22C *13/00*; F16L *11/00*
U.S. Cl. 17—1 R **8 Claims**



1. A casing article comprising, in combination:
a substantially rigid, thin wall, thermoplastic, hollow tubular core member serving as a casing carrier;
means at one end of said hollow tubular core member for operably connecting said tubular core member to a stuffing apparatus;
a cellulosic food casing length shirred and compacted onto said hollow tubular core member with an end of said casing being located in controlled close proximity to said connection means; and
a casing retention element for holding said casing length a predetermined distance from said connection means, said retention element consisting of an annular, double-walled, flange extending outwardly from around the side walls of said hollow tubular core member, said flange being integral with adjacent sections of said hollow tubular core member, said adjacent sections being of substantially equal diameter and being substantially axially aligned longitudinally with one another such that each section reinforces the other against longitudinal stress applied to said hollow tubular core member when said casing length is forcibly compacted thereon.

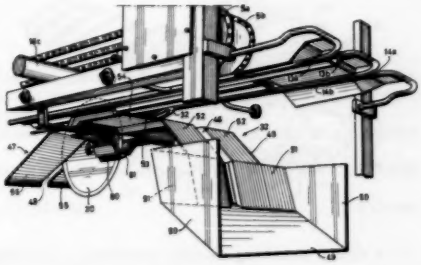
3. A casing article according to claim 1 wherein the hollow tubular core member is utilized as a stuffing horn and wherein the means for operably connecting said hollow tubular core member comprises a bell shaped shoulder and flange formed at the end of said tubular core member for attachment to the outlet nozzle of a stuffing apparatus.

4,439,891

DEVICE FOR DIVIDING SLAUGHTERED POULTRY

Martinus P. G. van Mil, Boxmeer, Netherlands, assignor to Stork PMT B.V., Netherlands

Filed May 24, 1982, Ser. No. 381,422
Claims priority, application Netherlands, Jun. 17, 1981, 8102919
Int. Cl.³ A22C *21/00*
U.S. Cl. 17—11 **8 Claims**



1. A device for longitudinally slaughtered poultry, comprising a conveyor means for the poultry for bringing it on to a stationary elongate positioning member co-operating with a guide member and a cutting member, characterized in that the conveyor member situated above the positioning member transports the bird suspended by its legs, and the guide member is formed by a guide surface situated beneath the positioning member and symmetrical with respect thereto, said guide surface having an upwardly sloping part which is situated in front of the positioning member and which is provided with a central wedge-shaped positioning groove for the bird's breast, and a substantially flat part situated beneath the postioning member and having the cutting means extending therethrough, said substantially flat part being followed by a downwardly sloping part.

4,439,892

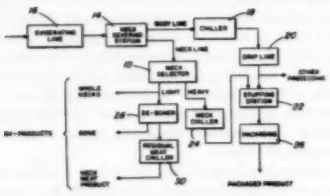
SEVERED POULTRY NECK SELECTION SYSTEM

Paul J. Altenpohl, High Point, N.C., assignor to W. F. Altenpohl, Inc., High Point, N.C.

Filed Feb. 23, 1982, Ser. No. 351,351
Int. Cl.³ A22C *21/00*
U.S. Cl. 17—52 **7 Claims**

1. In a product processing and packaging system having means for severing portions of objects during travel and sort-

ing means for separation of selected ones of the severed portions of the objects substantially deviating in one direction from a predetermined weight limit, the improvement comprising means responsive to said separation of the selected severed



portions for reassembly thereof with some of the objects prior to packaging, and means for processing the other of the severed portions separately from the reassembled severed portions.

4,439,893

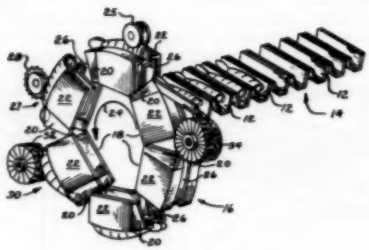
SPRING CAM FOR SHRIMP CLAMP

Edmund D. Betts, Libertyville, Ill., assignor to Gregor Jonsson Associates, Inc., Highland Park, Ill.

Filed Aug. 26, 1981, Ser. No. 296,529

Int. Cl.³ A22C *29/02*

U.S. Cl. 17—72 **18 Claims**



1. A shrimp processing machine comprising: a plurality of processing stations including a cutting station for cutting the shrimp lengthwise through the shrimp shells along the shrimp sand veins, and an adjacent deveining station for removing the sand vein of the shrimp; carrier means for transferring the shrimp through the processing stations, said carrier means including cam actuated clamps means for gripping the shrimp shells; and cam means between said cutting and said deveining stations arranged to controllably act upon said clamp means to cause an increase in pressure on the shrimp by said clamp means between said cutting and deveining stations for splitting the shrimp shells open to thereby expose the sand vein of the shrimp to the deveining station.

4,439,894

DOOR-OPERATED SAFETY SHUTOFF SYSTEM

Friedrich-Wilhelm Schwiers, and Trützschler, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,323

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034589

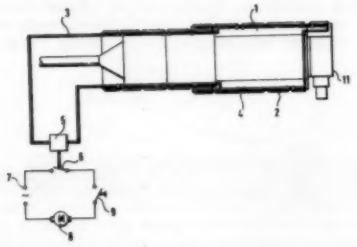
Int. Cl.³ F16P *3/08*; D01G *31/00*

U.S. Cl. 19—0.2 **3 Claims**

1. A safety system for a textile machine, said textile machine having a housing, a door mounted on the housing and having open and closed positions; a drive motor for operating components of said textile machine, an electric power circuit connected to said motor for supplying electric current thereto; said safety system being operatively connected with said door for presenting different output indications for said open position and said closed position; the improvement in said safety system comprising

(a) an air line;

(b) a pressure difference generator communicating with said air line and operatively connected with said door for altering the pressure of air in said air line when said door moves from said closed position to said open position;



(c) a pressure-responsive switch operatively connected with said air line for presenting an output indication in response to the alteration of air pressure in said air line;

(d) a source of pressurized air connected to said air line; and

(e) a solenoid valve connected between said source of pressurized air and said air line for controlling admission of air from said source to said air line; and

(f) pressure drop responsive means coupled to said air line and said solenoid valve for shutting off said solenoid valve upon predetermined pressure drop in said air line.

4,439,895

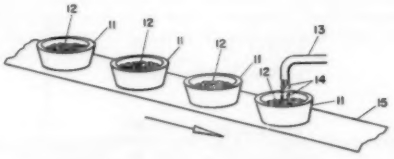
OXIDE REFRACTORY MATERIAL HAVING FINE CRYSTAL STRUCTURE; AND PROCESS AND APPARATUS FOR MAKING SAME

Wesley Q. Richmond, Stevensville, Canada, assignor to Kennecott Corporation, Cleveland, Ohio

Continuation of Ser. No. 920,577, Jun. 29, 1978, abandoned, which is a continuation of Ser. No. 565,978, Apr. 7, 1975, abandoned, which is a continuation of Ser. No. 452,226, Mar. 18, 1974, abandoned, which is a continuation of Ser. No. 153,302, Jun. 15, 1971, abandoned. This application Aug. 2, 1982, Ser. No. 403,987

Int. Cl.³ B01D *9/00*; C09C *1/68*

U.S. Cl. 23—305 A **5 Claims**



1. Apparatus for rapidly cooling and solidifying an oxide refractory melt, comprising:

(1) a solidification chamber having a closed bottom;

(2) a static bed of non-reactive, non-melting particulate solid steel sphere cooling media, said cooling media having a size ranging from about 5 to about 60 mm, packed within and filling the solidification chamber to a depth of at least about 15 cm;

(3) means for casting the oxide refractory melt into the solidification chamber, over the steel sphere cooling me-

dia, after the steel sphere cooling media are packed within the solidification chamber, said size, the composition of said steel and sizing of said means, being preselected to provide a grain having at least about 80% by numerical count of discontinous crystals having a size smaller than about 15 microns and the remainder of the discontinuous crystals having a size ranging from about 15 to 40 microns; and

(4) a magnet for recovering the cooling media from the solidified melt.

4,439,896

CLAMP FOR A BUNDLE OF CABLES

Kazuhiro Matsui, Toyoake, Japan, assignor to Kitagawa Industries, Co., Ltd., Aichi, Japan

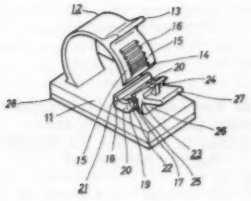
PCT No. PCT/JP81/00249, § 371 Date May 20, 1982, § 102(e) Date May 20, 1982, PCT Pub. No. WO82/01459, PCT Pub. Date Apr. 29, 1982

PCT Filed Sep. 21, 1981, Ser. No. 385,397

Claims priority, application Japan, Oct. 9, 1980, 55-141398

Int. Cl.³ B65D *67/02*; F16L *3/08*

U.S. Cl. 24—16 PB **4 Claims**



1. A clamp for a bundle of cables, comprising:

a resilient plastic base;

an escape hole formed in said base;

a guide portion extending from said base adjacent said escape hole, said guide portion having a first upstanding inclined wall at one side of said escape hole, a pair of second upstanding walls at a side of said escape hole opposite said one side and a pair of upstanding third side walls connecting said first and second walls, whereby said guide portion surrounds said escape hole and defines a portion of an inserting groove leading to said escape hole;

an engaging portion fixed to said base, said engaging portion including a support wall connected to said base, a claw connected to said support wall and being positioned between said second walls of said guide portion so as to define the remainder of said support groove, an inclined surface connected to said claw, and a release operating portion projecting from said support wall;

a C-shaped resilient arm having a first end integrally formed with said base and a free end constructed so as to be insertable in said inserting groove and said escape hole, said free end including a plurality of ratchet shaped projections formed on a central portion thereof, said projections being mutually spaced along a line connecting said ends of said resilient arm,

whereby said inclined wall of said guide portion and said inclined surface of said engaging portion guide said free end of said resilient arm into said inserting groove, whereby engagement of said claw with said projections retains said resilient arm in said escape hole, whereby said second walls of said guide portion abut portions of said free end not including said projections so as to support and secure said free end in said escape hole, and whereby said third walls laterally retain said free end of said resilient arm.

4,439,897

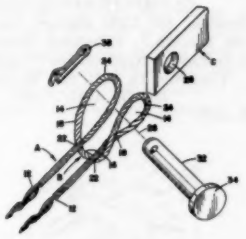
DEAD-END APPLIANCE FOR LINEAR BODIES

Robert S. Kindel, Cleveland, Ohio, assignor to Preformed Line Products Company, Mayfield Village, Ohio

Filed Dec. 22, 1981, Ser. No. 333,406

Int. Cl.³ F16G *11/12*

U.S. Cl. 24—115 N **11 Claims**



8. A dead-end appliance constructed primarily of relatively rigid linear elements for linear bodies comprising: a pair of elongated legs including gripping means for grippingly engaging a portion of a linear body; an integral connecting portion connecting said legs at one end thereof; said connecting portion including integral pin receiving eyes and a bight portion; said pin receiving eyes being interposed between said legs and bight portion along the length of said elements; and, said bight portion being located on the same side of said eyes as said legs.

4,439,898

SLIDE FASTENER STRINGER

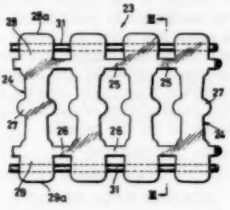
Kiyoshi Takeshima, Namerikawa, and Akira Hasegawa, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 331,269, Dec. 16, 1981. This application Jun. 1, 1983, Ser. No. 498,721

Claims priority, application Japan, Dec. 26, 1980, 55-188386

Int. Cl.³ A44B *19/30*

U.S. Cl. 24—401 **3 Claims**



1. A slide fastener stringer comprising:

(a) a stringer tape;

(b) a molded coupling element strip of continuous thermoplastic disposed on and along one longitudinal edge of such stringer tape, said tape including a succession of laterally spaced coupling elements each having a head and a pair of first and second legs extending from said head in a common direction, and said strip including a molded single pair of series of first and second thread-free connecting portions, each of said first connecting portions extending integrally with and between an adjacent pair of said first legs, each of said second connecting portion extending integrally with and between an adjacent pair of said second legs; and (c) a pair of connector threads extending transversely of said coupling elements along the full length of said strip and lying at confronting surfaces of

said first and second legs, of each said coupling element and being exposed therebetween, each of said exposed connector threads being normally parallel and spaced from a respecitve one of said pair of series of said thread-free first and second connecting portions toward the respective heel side of said first and second legs.

4,439,899

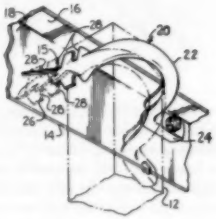
CLAMPING APPARATUS

Rudolph ReuBoiu, 597 Calle Hidalgo, San Clemente, Calif. 92672, and Kenneth L. Fiebelkorn, Monterey Park, Calif., assignors to Rudolph ReuBoiu, San Clemente, Calif.

Filed Nov. 12, 1981, Ser. No. 320,422

Int. Cl.³ A44B *21/00*

U.S. Cl. 24—458 **7 Claims**



1. Clamping apparatus comprising:

a first member having edge means defining a slot aperture with an enlarged wider portion and a narrower portion, and

a second member having a generally arcuate portion configured for extension about an object to be clamped between the first and second members,

said second member having a first end portion defining a plurality of pairs of notches, the respective notches of each pair being defined in opposite side edges of the end portion and being sized and configured to engage said first member slot edge means upon insertion of the first end portion in the wider portion of said slot and rotation thereof relative to the first member to attach the second member first end portion to the first member, and

fastener means adapted for adjustable securement on the second end portion of the second member, said fastener means being adjustable in position relative to the first member to retain and space the second member second end portion from the first member to a selected distance to clamp an object of particular size between the first and second members in cooperation with the engagement of a selected pair of said notches of a second end portion in the slot edge means of the first member.

4,439,900

SCAFFOLDING DEVICES

Jack G. Lowe, Belbroughton, near Stourbridge, England, assignor to Burton Delingpole & Company Limited, Warley, England

Filed Jul. 13, 1981, Ser. No. 282,582

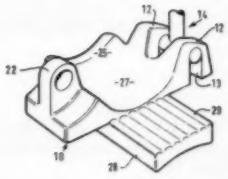
Claims priority, application United Kingdom, Jul. 16, 1980, 8023169

Int. Cl.³ F16L *3/04, 3/10, 3/24*

U.S. Cl. 24—514 **8 Claims**

1. A device for clamping together a scaffolding pole and a flange of a construction member, the device comprising first and second body members each having an arcuate seat to engage a surface portion of the scaffolding pole, and having cooperable therebetween screw threaded clamping means,

wherein the seat of the second body member is curved in a plane extending at right angles to the longitudinal axis of the pole and in a plane extending longitudinally of the pole, said second body member comprising an integral clamping portion which projects away from said seat and has a flange engaging surface, the clamping means being connected to the second body member between the clamping portion and the arcuate seat and comprising a single operating member, rotation of which causing the seat of the second body member to roll around the scaffolding pole and the flange-engaging surface of the clamping portion to move towards the scaffolding pole to bear against and make essentially area contact with the one side of the flange to press the other side thereof against the scaffolding pole to effect a rigid connection therebetween, and causing the body members to clamp around the scaffolding pole.



4,439,901

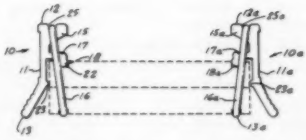
CLAMP

Roy T. Eddleman, Los Angeles, Calif., assignor to Spectrum Medical Industries, Inc., Los Angeles, Calif.

Filed Mar. 28, 1983, Ser. No. 479,335

Int. Cl.³ B65D *63/00*

U.S. Cl. 24—530 **7 Claims**



1. A multi-part assembly held by at least one clamp, said assembly comprising:

a clampable member having at least two parts;

a first interlocking area formed in the outer surface of one of said parts;

a second interlocking area formed in the outer surface of a second of said parts;

a clamp member comprising:

a base member;

a bail support arm extending inwardly with respect to said base member;

bail means having a pivot end and a clamp end, said bail means being held at the pivot end thereof by said bail support arm at a bail pivot point, said bail means having its clamp end shaped to be held by said second interlocking area formed in the outer surface of one of said parts, and said bail means being further adapted to pivot with respect to the base member; and

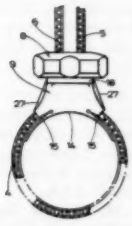
a flexible arm affixed to the base member, said arm having a contact area being shaped to mate with the first interlocking area in the outer surface of one of said parts and said contact area being located at a point within an arc formed by the movement of the bail means from its unclamped to its clamped configuration and being further located at a point so that it is flexed in a direction toward said bail pivot point when said clamp is affixed about the clampable member.

4,439,902

CLIP FOR SECURING AROUND A MEMBER SUCH AS A PIPE

Peter J. Huxtable, Merritts, Great Witley, Worcestershire, England

Filed May 28, 1981, Ser. No. 268,064
Claims priority, application United Kingdom, Jun. 5, 1980, 8018469; Jan. 6, 1981, 8100256
Int. Cl.³ B65D 63/00
U.S. Cl. 24—278 4 Claims



1. A clip for securing around a member comprising a flexible plastics strap of width substantially greater than the thickness thereof, opposite ends of said strap being formed on one side thereof with external screw thread portions, a body having a base for engagement with said member and an opposed abutment surface, a nut abutting with said abutment surface and having a bore provided with internal screw threads of complementary form to said external thread portions for meshing therewith, a peg depending from said body and upstanding from said abutment surface within said bore of said nut, said peg having opposed side faces which are spaced from said internal screw threads, said body being provided with a first pair of openings spaced a first distance apart in said abutment surface each opening being respectively adjacent to an opposed side face of said peg, with a second pair of openings respectively adjacent to opposite ends of said base and spaced a second distance apart greater than said first distance, and with a pair of guide passages each of which connects a respective one of said first pair of openings with a respective one of said second pair of openings for guiding said opposite ends of said strap into position in said nut in engagement respectively with said opposed side faces of said peg, each of said passages being arcuate along its entire length between said respective openings, whereby when said screw thread portions are meshed with said internal screw threads and said nut is rotated relative to said body both said strap ends are drawn through said nut to tighten said strap around said member, said body being formed of plastics material.

4,439,903

METHOD FOR PRODUCING AN INTERLACED MULTI-FILAMENT YARN

Tadayuki Matsumoto, Mishima; Kozo Imaeda, Sunto; Masatoshi Mineo, and Kiyoshi Nakagawa, both of Mishima, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

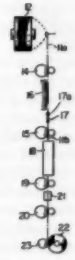
Continuation of Ser. No. 22,934, Mar. 22, 1979, Pat. No. 4,365,394, which is a division of Ser. No. 865,667, Dec. 29, 1977, abandoned, which is a division of Ser. No. 705,145, Jul. 14, 1976, Pat. No. 4,115,988. This application Sep. 21, 1981, Ser. No. 304,322
Claims priority, application Japan, Jul. 18, 1975, 50-87372
The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.
Int. Cl.³ D02G 1/20, 1/16; D02J 1/08, 1/16
U.S. Cl. 28—258 10 Claims

1. Method for producing an interlaced multifilament yarn having filaments which are not substantially broken comprising, in combination;

previously rubbing and scratching a material multifilament yarn with such intensity that individual filaments concon-

stituting said filament yarn are not substantially broken by a rotary rough surface member having sharp projections which are smaller than the cross-sectional diameter of the individual filaments of said material yarn to thereby increase the interlacing ability of the yarns;

then diffusing at least one jetted fluid, jetted in the yarn running direction along a predetermined yarn passage from a jetting aperture of a supply conduit through a nozzle formed with a rectifying and diffusing portion having a substantially uniform cross-section, said supply conduit being fixed with respect to members defining said yarn passage, said fluid being diffused along a direction parallel to said yarn passage in said rectifying and diffusing portion, said smaller sharp projections being at an upstream portion to the working portion of said jetted fluid;



said rectifying and diffusing portion having a height h, a slit provided for threading of the yarn, and wherein the minimum distance R from the top edge of the opening of said slit in the diffusing portion to the point where the yarn passage encounters the diffusing portion is at least $0.2 \times h$ and the slit width R at the opening in the diffusing portion is smaller than $0.4 \times h$ so that the yarn does not escape; and

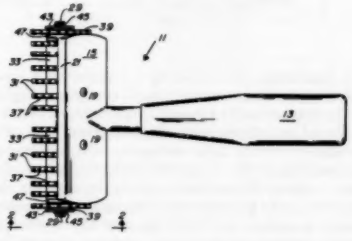
impinging said diffused jetted fluid against said running material multifilament yarn so that said individual filaments of said multifilament yarn mostly vibrate in a direction substantially parallel to a plane defined by the yarn running direction and the fluid jetting direction, the vibration taking place in a section of said yarn passage facing said rectifying and diffusing portion.

4,439,904

CARPET SEAMING ROLLER TOOL

Merle C. Hoopengardner, Lafayette, and William B. Wenzel, Alameda, both of Calif., assignors to Orcon Corporation, Union City, Calif.

Filed Aug. 10, 1981, Ser. No. 291,192
Int. Cl.³ B30B 3/00; B22F 3/18
U.S. Cl. 29—110.5 6 Claims



1. A bi-directional carpet seaming roller tool for drawing

two sections of carpet together at a seam during a hot melt seaming operation in which a hot melt adhesive on a carpet seaming tape has been heated to a molten state by a heated iron, said roller tool being constructed to continuously press the edges of the carpet sections down into the hot melt adhesive during both pushing and pulling movement of the roller tool forward and backward along the seam and to thereby permit the carpet installer to work quickly to get the carpet backing properly pressed down into the hot melt adhesive during the relatively short period of time that the hot melt adhesive remains in the open phase after the heating by the iron and before the hot melt adhesive cools down to a condition in which the carpet backing cannot be properly pressed into the rapidly solidfying hot melt adhesive, said roller tool comprising,

a main frame,

a handle connected to the main frame,

first and second rollers disposed side-by-side so that one roller grips one section of carpet and the other roller grips the other section of carpet as the roller tool is rolled back and forth along the seam, and

mounting means mounting each roller for swinging movement of the outer end of the roller backward and forward with respect to the inner end of the roller and effective to cause the rollers to automatically swing to positions which draw the two sections of carpet together at the seam during movement of the tool along the seam in both the pushing direction and the pulling direction, said mounting means including pivot means for each roller located inwardly of the mid point of the roller and providing a generally vertical axis for said swinging movement of the roller so that the outer end of the roller can swing back and forth in forward and rearward directions with pulling and pushing movement of the roller tool backward and forward along the seam.

4,439,905

INSTALLATION FOR REPLACING A CONTAMINATED FLUID CIRCUIT AND PROCESS FOR REPLACING THIS MEMBER

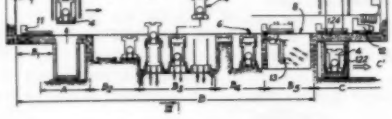
Pierre Gourdon, Paris; Rene Goutard, Verriers le Buisson, and Pierre Piry, Briis sous Forges, all of France, assignors to Commissariat a l'Energie Atomique, France

Filed Jul. 13, 1981, Ser. No. 282,602

Claims priority, application France, Jul. 15, 1980, 80 15606

Int. Cl.³ B22D *19/10*

U.S. Cl. 29—402.04 **9 Claims**



1. Installation for replacing a member in a contaminated fluid circuit, characterized in that it comprises a tight container (44) having internally a base (52) and supports (54) for said base supported on a framework (56); a module (18) which can be introduced into the tight container, said module comprising a horizontal base (20), a member (19) to be replaced fixed to said base, a ceiling (42) which is tightly fitted to the walls of the container, and a gripping head (40) making it possible to lift the module by means of a travelling crane (2); means centering the module relative to the tight container comprising vertical columns (58) integral with the base (52) of the container, and tubular spacers (70) integral with the module, each column comprising a lower centering part (60), an intermediate part (62) of smaller diameter, an upper centering part (64) and a truncated cylindrical head (66) connected to the upper centering part (64) by a smaller diameter collar (68); means tightly connecting the member (19) to the contaminated fluid circuit when the module is placed in said container (44) comprising vertical ducts (32) traversing the far end (48) and base (52) of the tight container, said ducts having ends facing feed (22) and discharge (24) pipes of the member (19), joints (36) placed between the ducts and the feed and discharge pipes, and means flanging or clamping themodule to the tight container so as to tighly seal the joints; and means driving the member (19).

4,439,906

METHOD OF PRODUCING TWICE THE NUMBER OF SINGLE OR RIBBON CONDUCTORS IN A PROCESSING MACHINE AND APPARATUS THEREFOR

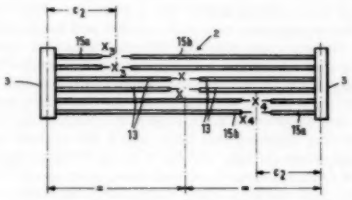
Manigel Heinz, and Ströter Hermann, both of Wuppertal, Fed. Rep. of Germany, assignors to Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co.

Filed Nov. 18, 1981, Ser. No. 322,340

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 3044319

Int. Cl.³ B23P *17/00*

U.S. Cl. 29—412 **6 Claims**



1. In a method for producing in the same processing machine individual lengths of conductors, which are equipped at one end with plugs or connector shells and at the other end are stripped of insulation, starting out from single or ribbon conductors, transported by a transport system in the processing machine, the conductors being equipped on both ends in an equipping station, the improvement comprising the step of

simultaneously cutting and stripping the insulation of the conductors by a cutting and insulation-stripping device following the equipping station in the processing machine, including

positioning the cutting and insulation-stripping device to be spaced from first longitudinal axes of the transport system, said first longitudinal axes being transverse to said conductors and adjacent to free ends of said conductors.

4,439,907

METHOD OF MAKING AN ABRASIVE DISC

Aleck Block, Los Angeles, and Arthur F. Carlson, South Gate, both of Calif., assignors to Merit Abrasive Products, Inc., Compton, Calif.

Division of Ser. No. 223,167, Jan. 7, 1981, which is a continuation-in-part of Ser. No. 55,630, Jul. 9, 1979, abandoned. This application Mar. 29, 1982, Ser. No. 363,248

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—432.1 **8 Claims**

1. A method of producing an abrasive disc, including the steps of:

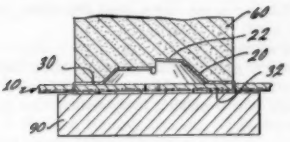
providing a backing member having first and second opposite surfaces and abrasive particles adhered to the first surface,

forming from a metallic sheet material a drive member having at a central position a boss with a single-turn internal

thread, a flange extending from the periphery of the boss and fingers extending from the periphery of the flange and having blunted outer ends,

folding the fingers to extend in a direction opposite to the boss and transverse to the flange,

directing the fingers through the second surface of the backing member and the first surface of the backing member at a high speed to a position displaced from the first surface



of the backing member to remove slugs from the backing member without the formation of burrs in the backing member, and

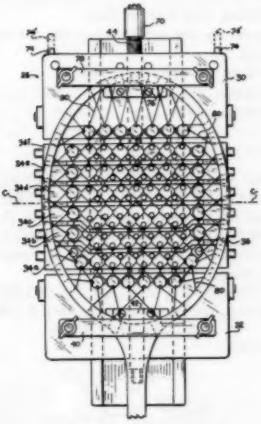
bending against the first surface of the backing member the portions of the fingers displaced from the first surface of the backing member to dispose such portions of the fingers in abutting and flush relationship with the backing member.

4,439,908

METHOD FOR STRINGING A RACQUET

Ernest McDonald, 5380 Poppy Blossum Ct., San Jose, Calif. 95123

Filed Sep. 30, 1982, Ser. No. 428,814
Int. Cl.³ A63B *51/00*; B23P *11/02*
U.S. Cl. 29—446 **2 Claims**



1. A method for stringing a racquet comprising the steps of:

(a) preparing a pre-strung web having a linear axis of expansion and a central axis substantially perpendicular to said axis of expansion, said web comprising string means woven into a number of parallel, interlocking, zig-zag rows such that interstices of said web are substantially diamond shaped having a longitudinal axis parallel to said linear axis of expansion and a transverse axis parallel to said central axis;

(b) successively spreading said zig-zag rows apart along said axis of expansion, said spreading beginning with the zig-zag rows most proximate said central axis and proceeding outwardly to the zig-zag rows most distal from said central axis; and

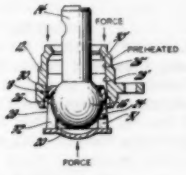
(c) attaching a perimeter portion of said pre-strung web to the head of a racquet.

4,439,909

BALL JOINT MANUFACTURE

Robert H. Borgen, Winona, Minn.; Harold J. Reindl, and Vernon L. Pickering, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 8, 1982, Ser. No. 396,347
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—453 **3 Claims**



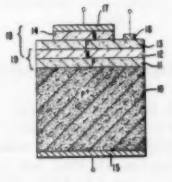
1. A method of forming a ball joint having a plastic liner disposed between a metal ball and a substantially cylindrical, metal socket wherein a tight fit is required therebetween comprising the steps of: (1) forming the liner so as to have a predetermined sliding fit with the ball and a predetermined oversize fit with the socket, (2) forcing the liner onto the ball, (3) heating the socket to a predetermined temperature which will melt the surface of the liner on contact therewith, (4) forcing the liner with the ball contained therein into the heated socket whereby the heat of the latter effects surface melting of the liner so as to conform with and seat on a prescribed surface of the socket, and (5) quenching at least the socket to solidify the liner whereby there is effected a tight assembled fit between the liner and the ball and also between the liner and the socket such that the tight fit between the ball and liner permits relative motion therebetween and the tight fit between the liner and the socket prevents relative motion therebetween.

4,439,910

PROCESS FOR FABRICATION OF MONOLITHIC TRANSISTOR COUPLED ELECTROLUMINESCENT DIODE

Prahalad K. Vasudev, Santa Monica, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 191,558, Sep. 29, 1980, Pat. No. 4,388,633. This application May 20, 1982, Ser. No. 470,101
Int. Cl.³ H01L *21/20*
U.S. Cl. 29—569 L **9 Claims**



1. A process for fabricating an amplifier for amplifying optical radiation which comprises:

(a) providing a highly doped substrate of a compound semiconductor material having a first conductivity;

(b) forming on at least a portion of said substrate a first epitaxial layer of a compound semiconductor material having the same conductivity as said substrate;

(c) forming on at least a portion of said first layer a second epitaxial layer of a compound semiconductor material

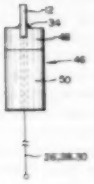
having a conductivity opposite to that of said first layer and being essentially undoped;
(d) forming on at least a portion of said second layer a third epitaxial layer of a compound semiconductor material having a conductivity the same as said first layer, said third layer having a thickness sufficient to provide the amplifier with a high emitter injection efficiency;
(e) forming on a portion of said third layer a fourth epitaxial layer of a mixed compound semiconductor having a conductivity the same as said second layer;
(f) forming an ohmic contact to said fourth layer; and
(g) forming an ohmic contact to said substrate.

4,439,911

METHOD OF MAKING AN OXYGEN SENSOR

Kenji Ikezawa, Yokohama; Hiroshi Takao, Kamakura; Satoshi Ambe, Yokosuka, and Masaaki Uchida, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 220,153, Dec. 23, 1980, abandoned. This application Nov. 16, 1982, Ser. No. 442,231
Claims priority, application Japan, Dec. 28, 1979, 54-170445
Int. Cl.³ G01N *27/58*
U.S. Cl. 29—570 **13 Claims**



1. A method of maintaining a solid electrolytic oxygen sensor element of an oxygen sensor unit having a support member at an effective operating temperature, comprising:
forming a first green conditioned body of a heat insulating material;
forming a second green conditioned body of a ceramic material;
forming a groove on a surface of said first body;
aligning said first and second bodies to form said support members;
sintering the aligned first and second bodies to intimately bond them together;
mounting said solid electrolytic oxygen sensor element in said groove to form said oxygen sensor unit;
wherein said heat insulating material has a lower thermal conductivity than said ceramic material, the thermal conductivity of said heat insulating material being less than on the order of about 0.01 cal.cm/cm^2-sec.C.°.

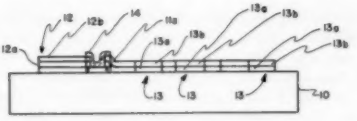
4,439,912

INFRARED DETECTOR AND METHOD OF MAKING SAME

John H. Pollard, and John B. Ramsey, Jr., both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 19, 1982, Ser. No. 369,774
Int. Cl.³ H01L *31/18*
U.S. Cl. 29—572 **2 Claims**

1. A method of making an infrared detector including the following steps:
prepare a semiinsulating substrate with an epitaxial layer atop;
remove portions of said layer to define at least one detector region;
chemically etch said region to round the corners thereof;
form conductive leads on said substrate and said layer thusly:
mask said substrate and said layer;
ion clean the unmasked portions of said substrate and said layer;
while continuing to ion clean, start depositing a molybdenum layer on mask, substrate, and layer;
stop ion cleaning;
stop depositing molybedenum when the desired thickness is reached;
ion clean the molybdenum;
while continuing to ion clean, start depositing gold-germanium alloy;
stop ion cleaning;
stop depositing gold-germanium alloy when the desired thickness is reached;
lift off mask and overlying molybdenum and gold-germanium alloy;



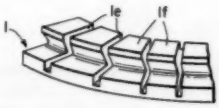
passivate the detector region thusly:
mask all regions of the substrate, the epitaxial layer, and the gold-germanium deposition except for the desired detector active region;
place the substrate in a gas-tight enclosure and pump a vacuum therein;
while continuing to vacuum pump, bleed oxygen into the enclosure;
ion clean the region exposed through the mask;
while continuing to ion clean, start depositing zinc sulfide;
stop cleaning, stop oxygen flow;
stop depositing zinc sulfide when the desired thickness is reached;
remove from gas-tight enclousre;
remove mask;
bond on output leads.

4,439,913

METHOD AND MEANS FOR MANUFACTURING FRONTAL COMMUTATORS OF ELECTRIC MOTORS, MORE PARTICULARLY OF THE TYPE HAVING AN INSULATION BETWEEN THE COMMUTATOR BARS

Michel Coquillart, St. Etienne Terrenoire, France, assignor to Mavilor Systemes, Switzerland

Filed May 8, 1981, Ser. No. 261,697
Claims priority, application France, May 9, 1980, 80 11151
Int. Cl.³ H01R *43/08*
U.S. Cl. 29—597 **7 Claims**



1. Method for manufacturing frontal commutators of electric motors, more particularly of the type having insulation between the commutator bars, characterized in that the commutator (1) is cut to length, the various necessary diameters are machined, a plurality of radial grooves (1*e*) are made on a face of a crown thus obtained and in which grooves insulating sheets (2) the profiles of which correspond to the sectional profile of the commutator but with slightly different dimensions, are inserted, the commutator is forced through a bore (3*a*) of slight taper of a tooling (3) to retain securely the sheets

(2) within the grooves (1e) by diametral contraction of the commutator, thin portions (1g) of the commutator which are situated between the radial grooves and the face of the commutator opposite to the grooves are removed by machining within a second tooling (5), the commutator thus prepared is placed between two parts (7-8) of a mold in which resin (10) for encasing the commutator equipped with its windings and the inner socket (9) is cast.

4,439,914
ADHESIVE OIL RESISTANT INSULATED WIRE CONSISTING OF TWO LAYERS INCLUDING AN UNCATALYZED EPOXY-PHENOXY RESIN OUTER LAYER

Daniel R. Sassano, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 24, 1982, Ser. No. 361,212
Int. Cl.³ B05D 5/12; B32B 15/08
U.S. Cl. 29—605 **8 Claims**

1. A method of making an insulated, bondable electrical conductor comprising the steps of:

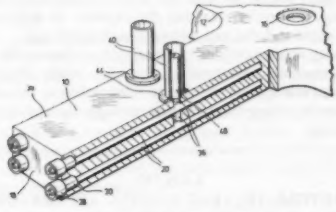
(1) continuously passing an electrical conductor, at least once, at a first rate of speed, through first resin application means, to provide a first insulating layer deposited about the conductor, and then

(2) continuously passing the insulated conductor, at the first rate of speed, through an adhesive resinous solution, and then a heating means at a temperature sufficient to drive off solvent, to provide a fusible adhesive layer coated directly over and contacting the first layer, where the adhesive solution consists essentially of the uncatalyzed solution mixture of an epoxy resin having an epoxy equivalent weight range of from about 250 to about 750 and a solid phenoxy resin, where the weight ratio of (epoxy resin):(phenoxy resin) in the mixture is from (1):(0.5 to 2.5).

4,439,915
HEATER INSTALLATION IN MOLDING MEMBERS

Jobst U. Gellert, 7A Prince St., Glen Williams, Canada

Filed Apr. 16, 1982, Ser. No. 369,193
Claims priority, application Canada, Mar. 31, 1982, 400058
Int. Cl.³ H05B 3/06
U.S. Cl. 29—611 **2 Claims**



1. A method of integrally installing an elongated electric cartridge heater in a steel injection molding member, the heater having a generally uniform cross section with a terminal portion at at least one end, the molding member having at least one end and a top, comprising the steps of:

(a) drilling a longitudinal bore in the molding member, the bore being slightly larger in diameter than the cartridge heater;

(b) drilling a filler duct in the molding member to extend from an upper end at said top of the molding member to intersect the elongated bore along its length;

(c) inserting the cartridge heater into a position in the elongated bore with a terminal portion extending at said at least one end, a small air space being formed around the heater in the bore;

(d) locating an open ended filler tube on the top of the molding member around the upper end of the filler duct, applying brazing material around the joint between it and the molding member as well as around the terminal portion of the cartridge heater at said at least one end and brazing the assembly in a vacuum furnace to fix the filler tube in position on the molding member and seal the bore around the heater;

(e) inserting a predetermined quantity of highly conductive material into the filler tube fixed to the molding member;

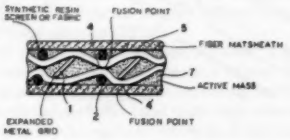
(f) vacuum casting the assembly in a vacuum furnace to melt the highly conductive material which flows down through the duct to fill the space around the heater, to provide an integral structure with the molding member; and

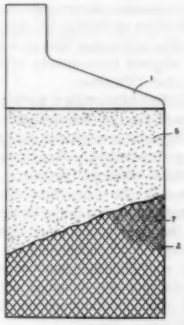
(g) machining off the filler tube after removal from the vacuum furnace.

4,439,916
METHOD OF MAKING A COMPOSITE ELECTRODE

Peter Faber, Karlstein, Fed. Rep. of Germany, assignor to Rheinisch-Westfalisches Elektrizitätswerk Aktiengesellschaft, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 118,793, Feb. 5, 1980, abandoned, and a continuation-in-part of Ser. No. 885,180, Mar. 10, 1978, abandoned. This application Jul. 23, 1982, Ser. No. 401,244
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 2710908
Int. Cl.³ H01M 4/22
U.S. Cl. 29—623.4 **4 Claims**





1. A method of making a composite electrode for a storage battery or the like which comprises the steps of:

applying to opposite sides of a metal support, formed with a surface distribution of throughgoing openings, respective flexible screen-like synthetic-resin openworks of filamentary material to form a resulting three-layered assembly;

sandwiching the entire resulting assembly between a pair of rigid ultrasonic welding plates having juxtaposed surfaces substantially coextensive with said openworks;

applying a mechanical pressure of substantially 2 to 20 g/cm² to said assembly by pressing said plates toward one another to deflect said openworks and simultaneously

subjecting same to ultrasonic welding by applying ultrasonic energy at a frequency of about 20,000 Hz across said plates for a period of about 1 to 2 seconds and only long enough to bond the filaments thereof together through said openings without bonding said filaments to the metal support, said openworks forming interstices on opposite sides of said support;

thereafter placing an active mass in said interstices and in contact with said support; and

fusing, by the application of heat and pressure, respective fine-porous flexible cover layers of synthetic resin to said openworks, the active mass being deposited in said interstices before said cover layers are emplaced thereon whereby the active mass is densified by the pressure subsequently applied to said cover layers.

4,439,917

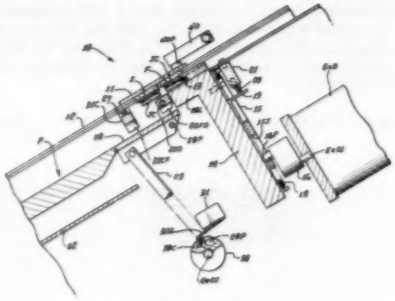
METHOD AND APPARATUS FOR AUTOMATICALLY EXTRACTING INTEGRATED CIRCUIT PACKAGES FROM ELECTRICAL SOCKETS

Rune S. Pearson, 2808 Oregon Ct. L-12, Torrance, Calif. 90503

Continuation-in-part of Ser. No. 142,367, Apr. 21, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,268

Int. Cl.³ H01R *43/00;* **B23P** *19/00*

U.S. Cl. 29—825 **24 Claims**



1. A method of extracting integrated circuit packages from integrated circuit sockets including the steps of

providing extraction apparatus having a plurality of extraction elements aligned transversely of the apparatus in a preselected location thereon,

positioning a printed circuit board having integrated circuit packages mouned on individual sockets on the board on the extraction apparatus with the integrated circuit packages extending downwardly from said board to permit relative movement between the board and the extraction elements to permit the extraction elements to be positioned a substantial distance between the integrated circuit packages and the electrical sockets therefor,

causing the apparatus to automatically and substantially simultaneously pull the integrated circuit packages from the electrical sockets in a direction substantially perpendicular to the plane of the electrical sockets to thereby remove the packages therefrom.

14. Apparatus for automatically extracting integrated circuit packages having their leads mechanically mounted in individual electrical sockets therefrom comprising,

extraction means having a plurality of extraction elements arranged in parallel alignment thereon and constructed and defined to receive a printed circuit board in alignment with the extraction element;

means for positioning a printed circuit board, having integrated circuit packages mounted on an individual electrical socket on said printed circuit board, on said extraction means in longitudinal alignment with the extraction elements to permit the extraction elements to be positioned between the circuit packages and the electrical sockets therefor upon the production of relative movement between said board and said extraction elements; and

means operatively mounted with said extraction means and operable for automatically extracting the integrated circuit packages from their mounted sockets in response to the preselected positioning of the extraction elements between the integrated circuit packages of said sockets to pull the extraction elements and thereby the integrated circuit packages away from their individual sockets in a direction substantially perpendicular to the plane of the electrical sockets to thereby remove the packages from the sockets without bending the leads thereof.

4,439,918

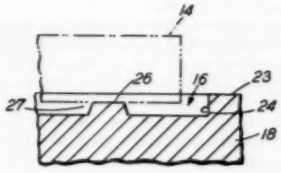
METHODS OF PACKAGING AN ELECTRONIC DEVICE

Arthur E. Carroll, II, Raytown, Mo.; Basil C. Lewis, Jr., Reading, Pa., and Howard T. Yeazel, Leawood, Kans., assignors to Western Electric Co., Inc. and Bell Telephone Laboratories, Inc., both of New York, N.Y.

Division of Ser. No. 19,543, Mar. 12, 1979, Pat. No. 4,346,396. This application May 7, 1982, Ser. No. 375,943

Int. Cl.³ H05K *3/34*

U.S. Cl. 29—840 **4 Claims**



4. A method of packaging an electronic device comprising:

spacing an electronic device by a predetermined distance from a substrate to form a gap between the device and the substrate;

providing solder for forming a substantially continuous layer of solder in the gap between the device and the substrate to bond the device to the substrate in a first solder-bonding operation and providing an excess of said solder;

retaining said excess of solder in a moat peripherally about the device in communication with the layer of solder in the gap; solder-bonding the electronic device to the substrate, the solder retaining the capacity to shift between the moat and the gap during said bonding and

attaching at least one lead to an upper surface of the device in a second solder-bonding operation while retaining the device in a spaced position in relationship to the substrate under an urging force exerted through the lead against the device.

4,439,919

AUTOMATIC LEAD MAKING APPARATUS

Ernest Cheh, W. Norwalk, and William Allen, Stratford, both of Conn., assignors to Burndy Corporation, Norwalk, Conn.

Filed Nov. 14, 1980, Ser. No. 207,046

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—861 **11 Claims**

1. A method for manufacturing an electrical wire lead comprising the steps of:

securing a first electrical connector to the leading end portion of at least one electrical wire at a work location which the leading end portion is being held by displaceable guide means;

feeding a pre-determined length of said wire axially in a given direction, said guide means guiding said wire as it is being fed;

gripping a portion of said wire;

cutting said wire at said work location;

displacing the guide means by pivoting it away from said work location before securing a second electrical connector to the

trailing end portion of said wire; and

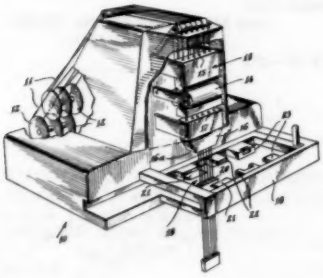
securing a second electrical connector to the trailing end portion of said wire at said work location.

2. An apparatus for withdrawing a pre-determined length of electrical wire from a supply, severing said pre-determined length from said supply, and installing an electrical connector on at least one end of said length, comprising:

feed means mounted on support means for advancing a pre-determined length of wire axially in a given direction;

guide means mounted on said support means having an entry for receiving wire from said feed means, and an exit for positioning wire at a work location;

gripper means mounted on said support means and spaced from the exit of said guide means along the given direction of motion of a wire, for gripping a portion of wire which has exited from said guide means;



cutter means positioned on connector carrying means and movable along a path transverse to said direction of motion of a wire intermediate said exit of said guide means and said gripper means for severing a wire which has exited from said guide means;

said connector carrying means movably mounted on said support means and movable along a path transverse to said given direction of motion of a wire, said path being positioned intermediate said exit of said guide means and said gripper means, for advancing a connector into position for an attachment to a wire which has exited from said guide means;

said guide means being movable mounted relative the path of said connector carrying means so that the exit of said guide means may be selectively and pivotably displaced away from the path of said connector carrying means to permit carrying a connector into position for attachment to a wire gripped in said gripper means; and

release means mounted on said connector carrying means for separating a severed, pre-determined length of wire from said gripper means.

4,439,920

DISPOSABLE RAZOR

Vincent J. Nauheimer, 121 Oneida Ave., Croton, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,610

Int. Cl.³ B26B *21/00*

U.S. Cl. 30—47 **4 Claims**

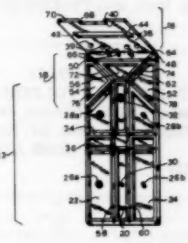
1. A disposable, foldable razor comprising:

a handle section, a blade, a blade holder section supporting said blade and a blade holder support section integral with said handle at its lower edges and integral with said blade holder at its upper edge;

said blade holder comprising upper and lower folded-together surfaces including said blade therebetween and an intermediate cut-out portion exposing the edge of said blade, and a back wall integral with said upper surface and maintained at a right angle thereto, said back wall at its lower edge being in integral, folding relation with the upper edge of said blade holder support section;

said handle and blade holder support sections together comprising in the flat position a rectangular section in integral folding relation at its upper edge with the lower edge of said blade holder section;

said handle section including (1) a pair of intermediate spaced, parallel, transverse score lines whereby the lower portion of said handle may be folded up so that its lower edge is in spaced, parallel relation with the line joining said blade holder and blade holder support sections, (2) a pair of spaced, parallel longitudinal score lines and an



upper transverse score line between the upper ends thereof integral with said blade holder support section, whereby said handle may be folded along same into a general "U" shape, and (3) retainer means for holding said lower portion in a folded position defined in (1) and in the "U" shape defined in (2); and

said blade holder support section including a first pair of score lines extending from the ends of said upper transverse score line upwardly and outwardly across said back wall to the distal edges of said right angle, a second pair of score lines extending from the ends of said upper transverse score line downwardly and outwardly to the edges of said rectangle, and defining with said upper transverse score line the integral, foldable boundaries of said handle and blade holder support sections.

4,439,921

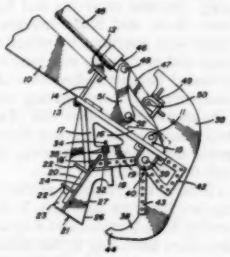
RAIL BREAKING ATTACHMENT FOR BACKHOES

Michael Ramun, and John Ramun, both of Youngstown, Ohio, assignors to Allied Gator, Inc., Youngstown, Ohio

Filed Feb. 24, 1982, Ser. No. 361,460

Int. Cl.³ F02F *3/28*

U.S. Cl. 30—134 **10 Claims**



5. A cutting and manipulating attachment for a backhoe, the bucket of which has been removed, and having a boom with controlled piston and cylinder connected thereto, comprising:

a mounting body and means for attaching the same to the boom of the backhoe;

means positioning a fixed cutting blade on said mounting body and means located at a first end of said fixed cutting blade pivotally mounting a movable cutting blade on said mounting body in pivotal relation to said fixed cutting blade; and

a rail breaking attachment operatively connected to said body and distinct from said fixed blade, said rail breaking attachment including: a pair of rail engagement members straddling said fixed blade, and straddling said movable blade; each of said rail engagement members comprising a rail supporting surface having a substantially inverted J configuration including a leg portion and a radiused portion, said radiused portion disposed adjacent said fixed blade, and said entire rail breaking attachment extending outwardly from said fixed blade toward said movable blade.

4,439,922

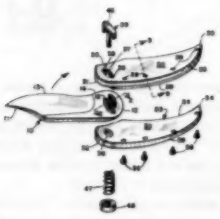
TAKE-DOWN FOLDING KNIFE

Salvatore Sassano, 1011 E. Harrison, Fruita, Colo. 81521

Filed Aug. 2, 1982, Ser. No. 404,320

Int. Cl.³ B26B *3/06*

U.S. Cl. 30—161 **5 Claims**



1. A take-down folding knife comprising:

(a) a blade having a free extremity and an opposed pivoted extremity, a cutting portion adjacent said free extremity and a tang portion defined by two flat, uniformly spaced faces adjacent said pivoted extremity,

(b) a pivot post fixedly attached to said tang portion and extending substantially equidistantly from each face thereof, said pivot post having a generally circular cylindrical outer surface the longitudinal axis of which is perpendicular to said tang portion, and an interior having a cylindrical recess in one extremity, a slotted recess in the opposite extremity, and a cylindrical channel communicating between said recesses,

(c) two elongated handle panels of substantially indentical outer perimeter configuration, each comprised of a blade-engaging extremity and an opposed free extremity, oppositely disposed receiving and back edges, and inner and outer faces, said blade engaging extremities being provided with apertures by which said panels pivotably engage said pivot post, said panels being interconnected by threaded fasteners adjacent said back edges to form an enclosure of uniform spacing between said inner faces,

(d) the aperture of at least one of said handle panels having two diametrically opposed locking recesses, said handle panel engaging the extremity of said pivot post having said slotted recess,

(e) a locking key disposed within said pivot post, said locking key having a generally T-shaped configuration comprising a leg portion, and a head portion having pendant shoulders extending in the direction of said leg portion, being adapted to slideably fit within said cylindrical channel and having a threaded extremity, said head portion being adapted to fit at least partially within said slotted recess while said shoulders enter said locking recesses,

(f) retainer means adapted to engage the threaded extremity of said leg portion and fit at least partially within said cylindrical recess, and

(g) a coil spring disposed about said leg portion and in abutment with said retainer means and said pivot post in a manner to draw said locking key into said pivot post, whereby

(h) the head portion of said locking key, when drawn into said pivot post by said spring, locks the position of the blade by engagement with said slotted recess and the locking recesses of one of said handle panels when the blade is either in its deployed mode or in its sheathed mode between said handle panels, and

(i) rotation of said blade to either of its two locked modes is permitted by forcing said locking key from said pivot post against the action of said spring.

4,439,923

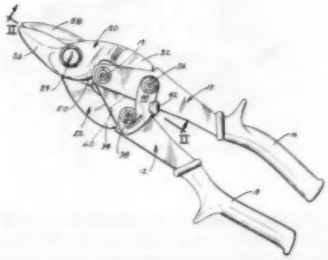
SNIP RIDE

Joseph A. Scranton, Fremont, Ohio, assignor to The Clauss Cutlery Company, a Division of Alco Standard Corporation, Fremont, Ohio

Filed May 5, 1982, Ser. No. 375,081

Int. Cl.³ B26B *13/26*

U.S. Cl. 30—252 **14 Claims**



1. In a snip comprising a pair of handle levers pivoted together at one end of each lever, a pair of cutting blade levers centrally cross-pivoted together and pivoted at their ends away from their blades to said handle levers near the pivot of said handle levers, the improvement comprising:

projections on said blade levers integral with said levers and extending radially outwardly and aligned diametrically opposite the blades from their cross-pivot, said projections providing rides which extend outwardly substantially more than the radial width of said blade levers orthogonally of said blade edges at their cross-pivot and which rides are in substantially the same plane as the contacting edges of said blades to be in contact with each other when said blades are cooperating for cutting to restrict spreading of said blades in a direction parallel to the axis of their cross-pivot.

4,439,924

ROTARY HAND KNIFE

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

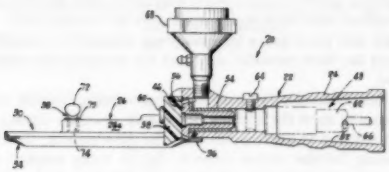
Filed Nov. 5, 1981, Ser. No. 318,386

Int. Cl.³ A22C *17/04*

U.S. Cl. 30—276 **19 Claims**

1. A hand knife for cutting meat and the like comprising a handle, a ring-like blade housing at one end of the handle, a continuous ring blade supported and guided for rotation by said housing, a blade retainer secured to the handle and located to engage an outer surface of the blade, and means to locate the retainer against the blade, said housing having an annular radial face and said blade having one axial end that is located

and guided by said face and a portion that extends from the face and terminates in a circular cutting edge, and said housing having an arcuate wall that extends axially from the radial face in the direction said blade portion extends and peripherally



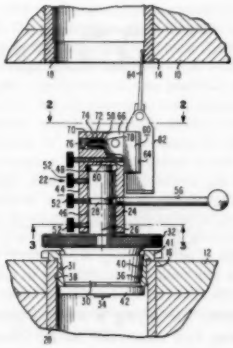
about said radial face no more than 180 angular degrees and located peripherally remote from the blade retainer, said arcuate wall including a lip directed radially inward of the housing that restrains axial movement of the blade relative to said radial face.

4,439,925

CONCENTRICITY MEASURING INSTRUMENT

Brian E. Lock, Oakland, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 3, 1982, Ser. No. 354,205
Int. Cl.³ G01B 5/25
U.S. Cl. 33—172 D **7 Claims**



1. Apparatus for measuring the alignment between two objects comprising:

a support including a cylindrical body having a longitudinal axis;

means for mounting said support on one of the objects with the longitudinal axis of said cylindrical body being along an alignment axis of the one object;

an elongated finger;

a housing having a cylindrical recess extending from one end, said cylindrical body fitting in said recess and supporting said housing for rotation about said longitudinal axis and said finger being mounted on said housing for pivotation toward and away from said longitudinal axis;

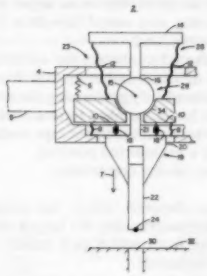
said finger being adapted to engage the other of said objects to determine the alignment of the other object with respect to the alignment axis of the one object.

4,439,926

TRANSFERRABLE-CENTER COMPLIANCE SYSTEM

Daniel E. Whitney, Arlington, and Thomas L. De Fazio, Watertown, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 6, 1982, Ser. No. 366,093
Int. Cl.³ G01B 5/25
U.S. Cl. 33—185 R **42 Claims**



1. A transferrable-center compliance system comprising:

an operator member;

a first remote center compliance (RCC) device including a frame and a plurality of radial members which are mounted and collapsible relative to said frame and which, in an erect condition relative to said frame, extend radially from a focus, for establishing a first remote center of compliance at, near, or beyond the free end of said operator member;

pliant support means for supporting said first RCC device when said radial members are collapsed relative to said frame and yielding to said first RCC device when said radial members are erected relative to said frame with said first remote center of compliance at, near or beyond the free end of an operator member; and

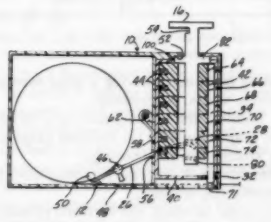
means for selectively erecting and collapsing said radial members relative to said frame, and thereby said first RCC device to shift the center of motion of the system between the first remote center of compliance at, near, or beyond the free end of an operator member when said first RCC device is erected and one or more other centers when said first RCC device is collapsed.

4,439,927

TAPE MEASURE

Larry E. Elliott, W. 10 Mile Rd., Apt. 9, Southfield, Mich. 48034

Filed Jan. 13, 1983, Ser. No. 457,620
Int. Cl.³ G01B 3/12; B43L 9/04
U.S. Cl. 33—189 **11 Claims**



1. A tape measuring device comprising:

a casing;

a coiled metal tape disposed within the casing, said coiled tape bearing indicia for ascertaining the length thereof;

a slot in the casing from which said coiled tape may be withdrawn and retracted;

marking means disposed within the casing for marking an article being measured;

braking means disposed within the casing and above the tape, said braking means including a member pivotally mounted within the casing and having a brake portion adapted to press downwardly on an upper surface of the tape for maintaining said coiled tape in a fixed position relative to the casing; and

actuating means adapted to contact the marking means and an end portion of the member spaced from the brake portion, for simultaneously positioning the marking means and pivoting the brake member so as to bring the brake portion into contact with the upper tape surface to secure the metal tape at a preselected position.

6. A tape measuring device comprising:

a casing;

a coiled metal tape disposed within the casing, said tape bearing indicia for ascertaining the length thereof;

a slot in said casing from which said coiled tape may be withdrawn and retracted;

braking means disposed within the casing for maintaining said coiled tape in a fixed position relative to the casing;

a carrier unit disposed within the casing;

consumable marking means located within the carrier unit for marking an article being measured;

actuating means for movably positioning the consumable marking means in order to mark an article and simultaneously activating said braking means to secure the metal tape at a preselected position;

space supplanting means for filling the space created in the carrier above the consumable marking means as the consumable marking means is consumed;

securing means for maintaining the consumable marking means in a fixed position relative to the carrier;

whereby, as the consumable marking means is diminished in length, the space supplanting means will transmit the positioning force applied to the actuating means to the consumable marking means.

4,439,928

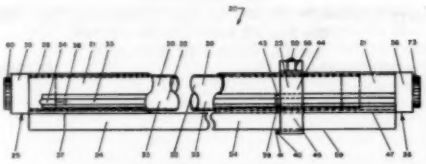
DRAFTING INSTRUMENT

Dwight E. Shoemaker, Jr., 6003 Autumn Forest Dr., Houston, Tex. 77078

Continuation-in-part of Ser. No. 97,128, Nov. 26, 1979, Pat. No. 4,314,408. This application Feb. 8, 1982, Ser. No. 346,960

Int. Cl.³ B43L 7/08

U.S. Cl. 33—494 **11 Claims**



1. A drafting instrument having a large number of independently viewable scales, comprising:

a hollow housing, the housing having a viewing slot;

a resilient graphics guide, the resilient graphics guide being fixedly attached to the housing;

a rear rotatable shaft, the rear rotatable shaft being adapted to fit within the housing;

a forward rotatable shaft, the forward rotatable shaft being adapted to fit within the housing;

a flexible graphics sheet, the flexible graphics sheet having a plurality of scales thereon, the flexible graphics sheet having a first end attached to the rear rotatable shaft, the flexible graphics sheet having a second end attached to the forward rotatable shaft, the flexible graphics sheet being adapted to be wound around the rear rotatable shaft or the forward rotatable shaft, the flexible graphics sheet being adapted to slide over the resilient graphics guide, the resilient graphics guide being adapted to urge the flexible graphics sheet into engagement with the viewing slot;

a right end piece and a left end piece adapted to rotatably hold the front rotatable shaft and the rear rotatable shaft; and,

a cursor assembly, the cursor assembly being slidably engageable upon the housing, the cursor assembly having a rib adapted to correspond with the viewing slot, the rib having hairline means thereon, the rib being adapted to engage the flexible graphics sheet and bring the hairline means into engagement with the scales to reduce parallax problems when the hairline means is viewed from different viewing angles.

4,439,929

APPARATUS FOR DRYING A CERAMIC GREEN HONEYCOMB BODY

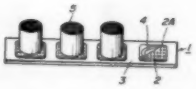
Jiro Kitagawa, Kasugai, and Isao Mizutani, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

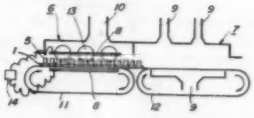
Filed Feb. 17, 1982, Ser. No. 349,476

Claims priority, application Japan, Feb. 23, 1981, 56-25121

Int. Cl.³ F26B 23/08

U.S. Cl. 34—1 **18 Claims**





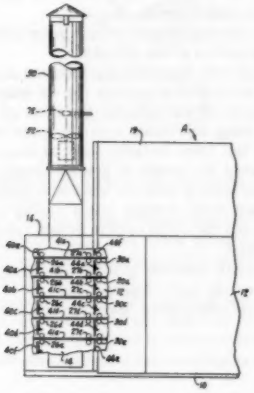
1. An apparatus for drying a ceramic green honeycomb body, comprising two electrodes facing toward each other with a spacing therebetween, one of the electrodes is grounded; a dielectric heating energy source is connected to the electrodes; and a support board is provided adjacent to the grounded electrode, between the two electrodes facing each other, the support board comprises a tray-like metallic first part designed to support the ceramic green honeycomb body and a plate-like non-metallic second part designed to hold the metallic first part, the tray-like metallic first part covering only a portion of the plate-like non-metallic second part, with the surface of the metallic first part being larger than that section of the ceramic green honeycomb body which is in contact with the metallic first part, the tray-like metallic first part is arranged so that it is isolated from any other tray-like metallic first parts by free areas on the support board so that during a drying operation a higher density of electric lines of force pass through the plate-like metallic first part than through the free areas.

4,439,930

CONVEYOR DRYER AND METHOD OF OPERATION

Irven J. McMahon, Jr., Painesville, Ohio, assignor to The Coe Manufacturing Company, Painesville, Ohio

Continuation-in-part of Ser. No. 231,274, Feb. 4, 1981, abandoned. This application Aug. 10, 1981, Ser. No. 291,485
The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.
Int. Cl.³ F26B 21/10
U.S. Cl. 34—15 11 Claims



1. In a dryer for reducing the moisture content of material in sheet form comprising an elongated generally horizontal stationary housing having material entrance and discharge ends, a continuous conveyor extending through said housing which includes a material drying chamber intermediate its ends and through which said conveyor extends, means externally of said drying chamber for recirculating gas lengthwise through said drying chamber in the direction in which the material is conveyed through said drying chamber and maintaining a gas pressure less than atmospheric in the material exit end of said chamber, means for heating the gas, a supplemental gas chamber at the material exit end of said drying chamber, means restricting entrance of air into the material exit end of said supplemental chamber, power actuated means connected to said supplemental chamber for exhausting gas therefrom, and means responsive to a condition in the dryer at the material feed end of said drying chamber for controlling the amount of gas exhausted from said supplemental chamber whereby a predetermined condition is maintainable in the dryer at the material feed end of said drying chamber and the gas pressure in said supplemental chamber may be maintained at a pressure less than that of the subatmospheric gas pressure in the material exit end of said drying chamber.

4,439,931

CONTROL MEANS FOR A DRIER

Masaji Mizuta, Uji, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 12, 1982, Ser. No. 357,625
Claims priority, application Japan, May 7, 1981, 56-65056[U]
Int. Cl.³ F26B 21/10, 21/12
U.S. Cl. 34—44 3 Claims

1. A control means for an electric drier receiving power from an alternating-current power supply and having an electric heater for heating air and an electric blower for moving the heated air over an object to be dried, comprising in combination:

(a) a semiconductor switch connected in series between the alternating-current power supply and the heater;

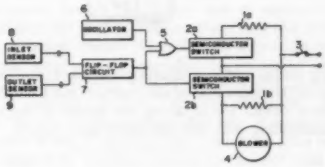
(b) an OR gate having two input terminals and one output terminal, the output terminal connected to the turn-on terminal of the semiconductor switch;

(c) an oscillator connected to one of the two input terminals of the OR gate which outputs a pulse for turning on the semiconductor switch in synchronization with a certain phase angle of the wave form of the alternating current from the power supply to operate the heater in a preheat mode at a percentage of the rated value;

(d) a flip-flop circuit having two input terminals and an output terminal connected to the other of the two input terminals of the OR gate;

(e) an entrance sensor connected to one of the input terminals of the flip-flop circuit and the blower for sensing the presence of the object entering the dryer, and

(f) an exit sensor connected to the other of the two input terminals of the flip-flop circuit and the blower for sensing the presence of the object leaving the dryer;



whereby, when the entrance sensor detects the entrance of an object into the drier and outputs a starting signal to the blower and the flip-flop circuit, the blower starts, the flip-flop circuit turns over and outputs a high level signal to the OR gate, the OR gate passes the high-level signal to the semiconductor switch, the semiconductor switch turns on the full rated power of the alternating voltage, and the second semiconductor switch turns on the blower; and, when the exit sensor detects the exit of an object out of the drier and outputs a stopping signal to the blower and the flip-flop circuit, the blower stops, the flip-flop circuit turns over and outputs a low level signal to the OR gate, the OR gate allows the pulse from the oscillator to pass to the semiconductor switch returning the heater to the preheat mode.

4,439,932

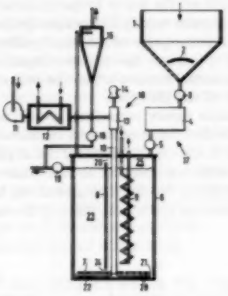
METHOD AND APPARATUS FOR THERMAL TREATMENT, ESPECIALLY DRYING, OF FINELY COMMINUTED BULK MATERIAL

Günther Gappa, Gelsenkirchen-Buer; Josef Degel, Hattingen, and Harald Jüntgen, Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 257,408, Apr. 24, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 479,110
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1980, 3016448
Int. Cl.³ F26B 17/10
U.S. Cl. 34—57 D 7 Claims

1. Apparatus for thermal treatment, especially drying, of finely particulated bulk material, comprising a reactor; means communicating with the interior of the reactor for feeding the material into the latter; a source of gas under pressure; a heat source; stirring means in the reactor having at least one hollow stirring arm connected to said source of gas and provided with openings for discharge of the gas into the material introduced into the reactor so as to form a whirling fluidized bed from the material in the reactor; heat-exchanger means connected to said heat source and extending into the whirling fluidized bed; means communicating with said reactor at a location spaced from said feeding means for discharging the material and the gas therefrom, said at least one stirring arm being located in a lowermost region of said reactor; means extending into the

whirling fluidized bed in the reactor for retarding flow of the material from said feeding means to said discharge means, said reactor being constructed so that the material passes in cascades therethrough, said reactor being an upright reactor, said



feeding means and said discharge means being located in the region of the upper end of said reactor; and a height-adjustable overflow device for adjusting the height of the material and communicating with the interior of said reactor.

4,439,933

APPARATUS FOR DRYING AND HEATING NYLON GRANULES

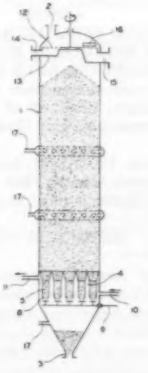
Ernst Dietrich, Worms; Ernst Guenther; Werner Hoerauf, both of Ludwigshafen; Ernst Kissel, deceased, late of Ludwigshafen (Gerd Kissel, legal representative); Hermann Linge, Carlsberg; Eckart Neumann, Frankenthal, and Eberhard Schaefer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 789,855, Apr. 22, 1977, abandoned, which is a division of Ser. No. 698,855, Jun. 23, 1976, Pat. No. 4,092,784. This application Jun. 22, 1978, Ser. No. 917,871

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1975, 2530304

Int. Cl.³ F26B *17/14*

U.S. Cl. 34—65 **1 Claim**



1. An apparatus for drying and heating granules, in which the granules flow downward through the apparatus, uniformly over its entire cross-section, the said apparatus being in the form of a vertical cylinder with an inlet at the top and a conically tapering outlet at the bottom, and possessing

(a) a rotatable screening ring fitted horizontally in the upper part of the cylinder and concentrically therewith and located below the inlet, said inlet being directed to said screening ring,

(b) a ring-shaped chute which is open upwardly and is located under the screening ring, said open area having at least the same area as said screening ring, said chute being sealed towards said screening ring and being divided by bulkheads into a greater part having an outlet for water and a lesser part having an outlet for inert gases,

(c) a granule scraper located above the screening ring in close proximity to said screening ring and being arranged ahead of the inlet for the granules in the direction of rotation of said screening ring,

(d) inlets for external supplies of inert gases in the downward extending section of the cylinder,

(e) a shell and tube heat exchanger located coaxially to the cylinder in the bottom quarter thereof ending above the conical taper of the cylinder, the tubes of the heat exchanger being distributed over the cross-section of the cylinder, said tubes including inlet orifices, the walls of which facing the stream of granules being inclined and forming an angle β with the horizontal which is from 45° to 82°, said walls forming edges joining in a roof-like structure and the outlet orifices of said tubes being conically tapered,

(f) a horizontally movable grid as flow control device located below the heat exchanger and

(g) a discharge zone located below the horizontally movable grid.

4,439,934

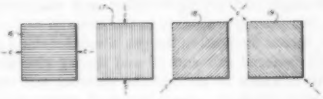
ORTHOTIC INSERT

Dennis N. Brown, 1091 Fir Ave., Blaine, Wash. 98230

Filed Feb. 26, 1982, Ser. No. 352,708

Int. Cl.³ A43B *13/38, 13/41*

U.S. Cl. 36—44 **17 Claims**



1. An insert removeably placed within a finished article of footwear comprising, in combination:

a full length first blank dimensioned to underlie the plantar surface of a person's foot and formed of flexible, resiliently deformable material along its entire extent,

a second blank extending from a cacaneal area of the person's plantar surface to a metatarsal head area bonded to a bottom face of said front blank and formed from alternating layers of fiberglass/resin and graphite,

two of said fiberglass/resin layers forming outer most surfaces of said second blank, said second blank molded and set to conform identically to the plantar surface of the person's foot along the areas of support therefor when the foot is beneficially oriented,

each said graphite layer formed from a bundle of graphite fibers directionally oriented along specific axes to provide controlled, preprogrammed deformation of said insert when used in a gait cycle,

whereby said insert nests within the inner portion of the finished footwear article and provides continuous control of weight distribution to the foot by insert distortion as the weight is shifted from the calcaneal area forward through the subtalar and midtarsal joint and thence to the metatarsal heads.

4,439,935

CONVERTIBLE HIGH STYLE FOOTWEAR

Celeste Kelly, 4302 W. Greenway, Glendale, Ariz. 85023

Filed Jun. 17, 1982, Ser. No. 389,419
Int. Cl.[3] A43B 3/24, 3/12
U.S. Cl. 36—101 7 Claims

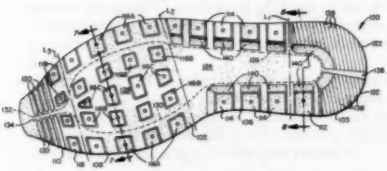
1. A shoe with replaceable vamp and insole comprising:
shoe base means;
unit-construction shoe upper means adapted for removable coupling to said shoe base means including vamp means attached to an insole generally visible about the periphery of a wearer's foot;
coupling means for removably coupling said unit construction shoe upper means to said shoe base means; and
said vamp further comprises a vamp extension extending below said attached insole and overlapping said shoe base.

4,439,936

SHOCK ATTENUATING OUTER SOLE

Thomas E. Clarke, Exeter; William R. Peterson, Portsmouth, and Mark G. Parker, Exeter, all of N.H., assignors to Nike, Inc., Beaverton, Oreg.

Filed Jun. 3, 1982, Ser. No. 384,545
Int. Cl.[3] A43B 5/00, 1/10, 13/18, 13/04
U.S. Cl. 36—102 30 Claims



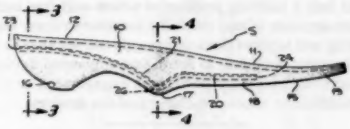
1. An outer sole for an athletic shoe comprising:
a base formed of a relatively thin resilient material and having a heel section, an arch section, a forefoot section, a toe section, an upper major surface and a lower major surface;
a plurality of discrete traction elements extending downward from said lower major surface of said base at spaced transverse and longitudinal locations including a plurality of discrete heel and arch traction elements located about longitudinally spaced locations adjacent the perimeter of said base in said heel and arch sections respectively;
a rear shock attenuating area extending generally along the central longitudinal portion of said heel and arch sections, said rear shock attenuating area being substantially devoid of traction elements so that the relatively thin resilient material of said base in said rear shock attenuating area depresses downwardly during foot strike to attenuate the force of foot strike.

4,439,937

INTEGRALLY CAST SHOE SOLE CONTAINING STIFFENER MEMBER

Alexander C. Daswick, 700 Orange Grove #210, South Pasadena, Calif. 91030

Filed Jul. 26, 1982, Ser. No. 402,060
Int. Cl.[3] A43B 13/04, 23/00
U.S. Cl. 36—107 11 Claims



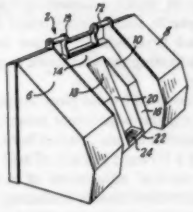
1. A shoe sole structure having an upper surface adapted to support the entire foot of the wearer and an under surface adapted to engage the ground, characterized by a rear pedestal extending downward beneath the heel of the shoe and a central pedestal being longitudinally rounded on its under side to provide a roller-like portion of said sole structure under surface, said rear pedestal being very resilient while said central pedestal has far less resiliency, and said sole structure being easily bendable at and forward of the metatarsal arch region but being resistant to bending rearwardly thereof; said shoe sole structure being formed from a stiffener member which extends from the heel to the metatarsal arch region and has a downward protrusion at the instep, and a solid casting of elastomeric material which surrounds and encloses said stiffening member.

4,439,938

COUPLING MECHANISM

David Grant, Newcastle upon Tyne, England, assignor to Envirotech Corporation, Salt Lake City, Utah

Continuation of Ser. No. 321,785, Nov. 16, 1981, abandoned.
This application Nov. 4, 1983, Ser. No. 549,213
Claims priority, application United Kingdom, Nov. 17, 1980, 8036826; Feb. 6, 1981, 8103779
Int. Cl.[3] E02F 3/76
U.S. Cl. 37—117.5 8 Claims



1. A coupling system for use with a service vehicle comprising:
a support device which is mounted upon the service vehicle and a readily separable operating device, said support and operating devices having complementary rear and forward portions, respectively, with said operating device having a central profiled portion to receive a complementary forward portion of said support device;
two transversely-spaced, upwardly-facing, outwardly divergently angled lifting forks fixed to the upper portion of said support device;
one or more transversely-disposed lifting pins mounted on the upper region of said operating device and positioned for location in said forks to enable said operating device to pivot about the axis of said lifting pins when elevated by

said lifting forks to bring said complementary portions into engagement thereby inhibiting further relative movement of the two devices transverse to the axis of said lifting pins; and

a latch bar mounted to said support device having a free end, and said operating device having a receiving member having an upwardly open aperture formed therein mounted within said central profiled portion, means operable from a remote source to selectively move said latch bar into a latching position at which said free end enters said aperture in said receiving member to draw said operating and support devices towards one another to take up a latching condition to retain said connected devices with said complementary portions in engagement, or a release condition to allow detachment of the devices.

4,439,939

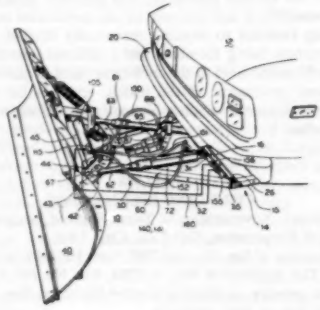
SNOW PLOW

James R. Blau, 13220 W. Burlawn Ct., Brookfield, Wis. 53003

Continuation-in-part of Ser. No. 884,690, Mar. 8, 1978, Pat. No. 4,187,624. This application Mar. 16, 1979, Ser. No. 21,220

Int. Cl.³ E01H *5/06*

U.S. Cl. 37—231 **1 Claim**



1. A snow plow assembly suitable for use with a wheeled vehicle comprising:

a plow support frame adapted for being coupled to a wheeled vehicle, said support frame including an arcuate segment and first cylinder means and second cylinder means for adjusting the horizontal angular orientation of a plow blade;

a plow blade coupled to said plow support frame and to said horizontal angular adjustment means;

vertical adjustment means coupled between the front of said vehicle and a forward portion of said plow support frame to permit vertical adjustment of said plow blade, said vertical adjustment means including a bell crank means and third cylinder means mounted to said plow support frame and having piston rod means coupled to said bell crank means;

a hydraulic system including hydraulic fluid reservoir, pump and valve means mounted to said arcuate segment and coupled by hose means to said horizontal angular adjustment means and to said vertical adjustment means; control means coupling said vehicle and said hydraulic system for actuating said horizontal angular adjustment means and said vertical adjustment means from the vehicle cab;

said plow support frame further includes a generally triangular frame having first, second and third sides, said first side being pivotally coupled to said vehicle whereby the plow support frame is vertically rotatable with respect to said first side, said plow blade being mounted to the corner of said plow support frame between said second and third sides, each of said cylinder means being pivotally mounted to said first side with said third cylinder means being intermediate said first and second cylinder means;

said snow plow assembly further includes a vehicle subframe rigidly coupled to the underside of said vehicle and including a front member extending across and beneath the front of said vehicle, a pair of spaced apart brackets being located on said front member and having axially aligned holes passing therethrough, said first side of said plow support frame including a pair of bracket plates adapted for being coupled to said spaced apart brackets by pin means;

said plow support frame further includes a bell crank receiving bracket at an area thereof generally adjacent said plow blade;

said bell crank means includes a first generally Y-shaped link member the base of which is pivotally coupled to the front of said vehicle and a second generally L-shaped link member having first and second sides, the end of said first side of said L-shaped link member being coupled between the free ends of said first link member and the end of said second side of said L-shaped link member being pivotally coupled to said piston rod of said first cylinder, the angular corner of said L-shaped link member being pivotally coupled to said bell crank receiving bracket.

4,439,940

DISPLAY BRACKET AND ATTACHMENT

George Deryk, c/o Colour Screen Pty. Ltd., 74 Wentworth Ave., Sydney, New South Wales 2000, Australia

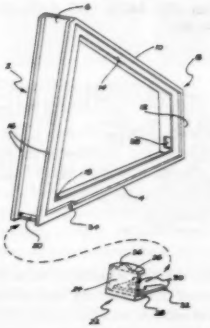
PCT No. PCT/AU81/00121, § 371 Date Apr. 22, 1982, § 102(e) Date Apr. 22, 1982, PCT Pub. No. WO82/00578, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 25, 1981, Ser. No. 375,273

Claims priority, application Australia, Aug. 26, 1980, PE5237

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—10 R **7 Claims**



1. A display bracket for holding a flat display article and having a substantially trapezoidal shape comprising a base side for resting on a horizontal surface, an upright inclined side for supporting said flat display article comprising a shallow channel section which faces forwardly, in combination with a clamp carried by the bracket adapted to clamp the flat display article to the inclined side, said clamp having a rearwardly projecting flexible lip which extends into the space defined by the channel section in order to impose a curve upon the cross-section of the flat displaying article rendering it sufficiently rigid to remain erect, a rearwardly facing side being adapted to engage an attachment mountable on a column.

4,439,941

CARD WITH REMOVABLE AND REUSABLE INSERT

Edward Halperin, Allentown, Pa., assignor to Greet 'N Wear, Inc., Virginville, Pa.

Filed May 24, 1982, Ser. No. 381,475
Int. Cl.³ G09F 1/00
U.S. Cl. 40—124.1 6 Claims

1. A card, tag or the like, comprising:
a sheet member forming at least a part of said card, tag or the like;
a face of said sheet member having a pattern printed thereon;
a reduced adhesive bonding surface on said face of said sheet member;
a multicolored embroidered emblem releasably attached to said face with said multicolored embroidered emblem forming an integral part of the pattern printed on said face;
said face of said sheet member being provided with printing of the same pattern as contained on the multicolored embroidered emblem on the face of said sheet member at the location where said embroidered emblem is releasably attached to said face;
said multicolored embroidered emblem being constructed of embroidery threads of a single color to form a sculptured pattern on the face thereof created at least in part by varying the direction and number of embroidery thread stitches in various locations of the embroidered emblem, and said multicolored pattern being printed on the face thereof with at least two colors of dyestuff, said printing thereon being in registry with the sculptured pattern of said embroidered emblem wherein selected colors are printed on selected sculptured portions of the sculptured embroidery, and a layer of thermoplastic adhesive being provided on the backside of said embroidered emblem; and
whereby said sheet member may be transferred to a recipient, and whereby the recipient may remove said embroidered emblem and apply said emblem to an article of clothing or the like by means of a layer of thermoplastic adhesive by application of heat and pressure.

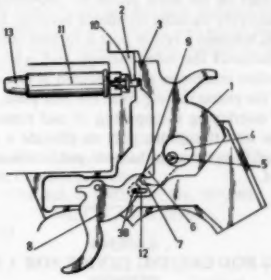
4,439,942

REVOLVER TYPE FIREARMS

Jose Mª Gabilondo, Vitoria, Spain, assignor to DLlama-Gabilondo y Cia, S.A., Vitoria, Spain

Filed Jul. 30, 1980, Ser. No. 173,584
Claims priority, application Spain, Jul. 30, 1979, 482.947
Int. Cl.³ F41C 17/08, 1/00
U.S. Cl. 42—66 1 Claim

1. Improvements in revolver type firearms, characterized in that a trigger (8) is connected to the end of a pawl (6) by a projection (38) of said trigger (8) which is housed in an opening (12) of said pawl (6), pawl (6) which in turn is connected eccentrically to a circular part (4) on which a hammer (1) turns so that upper end (3) of said hammer (1) rests directly on a frame (2) when said trigger (8) is in rest position, in which a tooth (9) of said trigger (8) comes in contact with another tooth (7) of said hammer (1), and so that, when said trigger (8) is pulled, said hammer (1) rotates on said pawl (6) and at the same time said hammer (1) describes a downward movement to a point at which said hammer (1) and said trigger (8) are disconnected, said hammer (1) being thrown forward, an end (3) of said hammer (1) occupying the lowest position or fire position against a firing pin (10), and said pawl (6) the nearest position



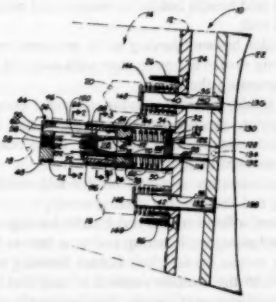
to the horizontal position, while when pressure is let up on said trigger (8) it returns to the rest position and said pawl (6) turns towards a vertical position making said hammer (1) describe an elevation movement resting as at the beginning on said frame (2) of the firearm.

4,439,943

RECOIL REDUCER

Rodney D. Brakhage, P.O. Box 245A, Rural Rte. 2, Perkins, Okla. 74059

Filed Mar. 9, 1982, Ser. No. 356,416
Int. Cl.³ F41C 23/00
U.S. Cl. 42—74 11 Claims



11. A recoil reducer for a shoulder firearm, comprising:
a butt plate adapted for mounting on the butt of the firearm and having a butt plate aperture formed therethrough;
a hydraulic cylinder mounted on one side of the butt plate about said aperture and extending therefrom into a cavity formed in the stock of the firearm,
a main piston slidably disposed in the cylinder, the main piston having a peripheral surface slidingly sealed to the inner surface of the hydraulic cylinder and opposed sides intersecting the peripheral surface of the main piston and extending across the hydraulic cylinder;
a piston rod connected to the main piston and extending therefrom through the butt plate aperture;
a follower piston disposed between the main piston and the butt plate, the follower piston having a bore formed therethrough through which the piston rod extends;
means for urging the follower piston toward the main piston;
an auxiliary plate positioned rearwardly of the butt plate

with respect to the butt of the firearm and spaced a distance from the butt plate; and

means for securing the end of the piston rod remote from the main piston to the auxiliary plate;

wherein the recoil reducer is characterized as having means formed in part on the main piston for providing a fluid flow path of selectively variable resistance between the sides of the main piston; wherein a return port is formed through the main piston to intersect the sides thereof; and wherein the recoil reducer further comprises a leaf secured at one end thereof to the side of the piston remote from the butt plate, the other end of the leaf overlaying the opening of said remote side of the main piston into the return port to provide a unidirectional path for fluid flow through the main piston toward said remote side thereof.

4,439,944

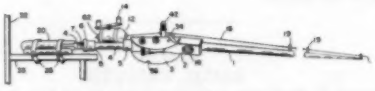
FISHING ROD CASTING DEVICE FOR A DISABLED PERSON

Van W. Johnson, Rte. 1, Box 86, Leoma, Tenn. 38468

Filed Nov. 13, 1981, Ser. No. 320,928

Int. Cl.³ A01K *91/02*

U.S. Cl. 43—19 **10 Claims**



1. A fishing rod casting device comprising, in combination:

a handle holder having clamping means to fixedly secure the same to a wheelchair;

means on said handle holder to receive and retain the handle of said rod;

a rod holder housing having at its proximal end adjustable mounting means in connection with said rod handle rotatably mounting the same;

said rod holder housing, having a pivotal connection for a rod holder, positioning selectively a rod holder in an extended cast position arcuately reciprocal in a withdrawn cocked position;

retaining means on said rod holder adjustably securing a casting rod thereto in a casting mode;

a crank reel affixed to the rod handle having a casting line threaded along said casting rod to a lure to be cast;

clamping means on said rod holder housing automatically reactive to the arcuate position of said rod holder to adjustably clamp said casting line releasable at the critical cast point;

an operating lever on said rod holder, with means for engaging an operating member manipulated by a fisherman, said lever reciprocally movable by the operator to alternately actuate said rod in an arcuate casting motion and in a withdrawn cocked position;

adjustable spring biasing means on said rod holder housing adjustably urging said rod holder in minimal resistance assisting in actuation of the rod holder in casting mode and providing minimal resistance to actuation of the rod holder in cocking mode;

locking means on said rod holder housing and rod holder minimally resistant to actuation by an operating member to lock said rod holder in cast or withdrawn mode;

an operating support member having a shank preformed and shaped to affixation to the movable functioning body portion of a disabled person, and a distal end configurated to engage the operating lever of said rod holder, locking means and reel actuation crank.

4,439,945

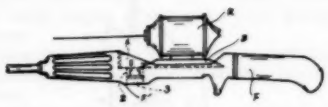
INSTANT PUSH-BUTTON FASTENER FOR FISHING REEL SEAT

Paul P. H. Chang, and Cheng-hsiang Chu, both of Room 3, 7 Fl., No. 603, Tung-Hwa S. Rd., Taipei, Taiwan

Filed Aug. 25, 1981, Ser. No. 296,011

Int. Cl.³ A01K *87/06*

U.S. Cl. 43—22 **9 Claims**



1. An instant push-button fastener for fastening a fishing reel seat to a handle of a fishing rod comprising:

a coupling sleeve disposed in said handle of said fishing rod;

a depressable clamping button comprising:

an engaging head for insertion into and fixed retention by said coupling sleeve,

a clamping hood for securing said fishing reel seat to said handle, and

first biasing means associated with clamping hood for urging said fishing reel seat toward said handle; and

a releasing button disposed in said coupling sleeve for releasing said engaging head from said coupling sleeve.

4,439,946

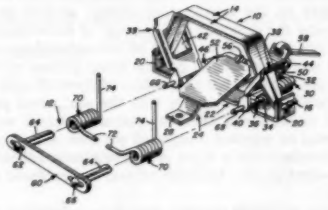
BOOSTER SPRINGS FOR COIL SPRING TRAP

Anthony L. Altier, Rte. 6, P.O. Box 286, Honesdale, Pa. 18431

Filed Jul. 12, 1982, Ser. No. 397,231

Int. Cl.³ A01M *23/30*

U.S. Cl. 43—81 **6 Claims**



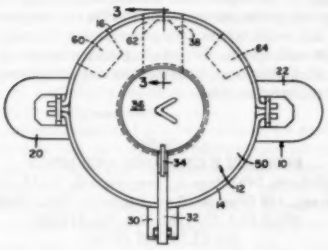
1. In a two-spring trap having a pair of jaws, a U-shaped spring frame with a bight portion to one side of the jaws and a pair of opposed legs extending from the bight portion laterally toward the jaws, a follower plate pivotally mounted on each leg and engaged with the jaws, a single coil spring mounted on each leg between the follower plate and the bight portion and engaging the follower plate with a resilient biasing force, each leg including a portion extending beyond the follower plate a length substantially less than the length of leg receiving the coil spring; the improvement comprising means for increasing extension of said legs beyond the follower plates, said means comprising a pair of spring mounting members, each spring mounting member being elongated and including a tubular open end portion telescopically receivable over the extending portion of one of said legs of the spring frame, and a pair of second coil springs, each mountable on one of the spring mounting members for biasing engagement with a follower plate, each second coil spring including a first laterally extending tensioning leg engageable with a follower plate for enhancing the biasing force thereon, and a second laterally extending spring stabilizing leg engageable with a fixed portion of the trap.

4,439,947

TRAP INSERT

John D. Smagner, 282 W. 12th St., Elmira, N.Y. 14903

Filed Sep. 27, 1982, Ser. No. 424,739
Int. Cl.³ A01M 23/26
U.S. Cl. 43—96 7 Claims



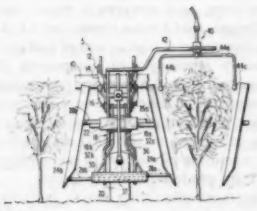
1. An insert for use in combination with an animal trap having a frame, a pair of jaws rotatably mounted on said frame, a pan located between said jaws when said jaws are in the set position, spring means on said frame to urge said jaws toward each other from a set position, means pivotally mounting said pan on said frame, and a dog adapted to contact said pan and hold said jaws in the set position, said insert comprising a disc-shaped device of resilient material having a flat top surface parallel to the top surface of said pan and substantially filling the area between said pan and said jaws when in their set position, said insert having a centrally located aperture which is of the same shape as said pan and slightly larger than said pan, said insert having a slot extending through its entire thickness between said aperture and the outer periphery thereof for receiving said dog, and support means for maintaining the flat, top surface of said insert at a level that is at or near the topmost surface of said jaws when in the set position.

4,439,948

AGRICULTURAL SPRAYING APPARATUS AND METHOD

William P. Brown, Ozark, and Jerrell W. Harden, Banks, both of Ala., assignors to Brown Manufacturing Company, Ozark, Ala.

Filed Feb. 4, 1982, Ser. No. 345,758
Int. Cl.³ A01M 21/00
U.S. Cl. 47—1.7 11 Claims



1. A crop spraying apparatus, comprising:

main mounting means for mounting the apparatus to a motive source;

spray nozzle means coupled to said main mounting means and adapted to be disposed in the row middle between two adjacent crop rows of a field during operation of the spraying apparatus for spraying liquid material in and around the row middle and bases of plants being sprayed; and

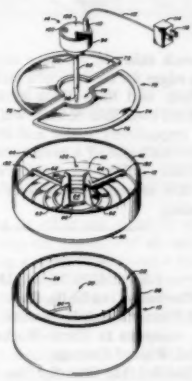
knock down means coupled to said mounting means to be spaced above the ground and to extend substantially across said row middle between but not including said adjacent crop rows during operation of the spraying apparatus for contacting weeds during operation of said apparatus and for pushing down on said weeds in said row middle, said knockdown means being located sufficiently close to said nozzle means to permit said nozzle means to spray said liquid material onto said weeds from the bases to the tips thereof and to permit said liquid material to be applied in a substantially uniform pattern to the soil and around the crop bases.

4,439,949

BEAN SPROUTER

Stephen Ocko, Brookline, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.

Filed Jul. 6, 1982, Ser. No. 395,801
Int. Cl.³ A01G 31/00
U.S. Cl. 47—61 12 Claims



1. A seed sprout grower comprising:

a base having a reservoir storing water for feeding and washing the sprouts and a waste water chamber for receiving used water after it has been supplied to the sprouts,

a container supported by the base above the reservoir and waste water chamber in which the seeds are deposited and the sprouts are grown,

a number of passages through the container communicating with the waste water chamber for allowing water in the container to drain into said chamber,

a pump including an inlet communicating with the water in the reservoir and having an outlet extending to the container, said outlet enabling the pump to spray water about the seeds, a portion of said water washing the seeds and flowing through the passages to the waste water chamber,

a timer-motor connected to the pump causing water to flow from the reservoir to the container for selected periods at selected intervals,

and a cover enclosing the container.

4,439,950

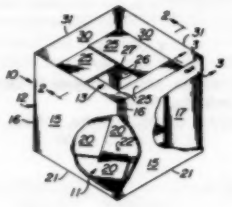
INTEGRAL PLANT CONTAINER AND COVER

Albert W. Kelley, Rt. No. 1, Box 28, Creamridge, N.J. 08514

Continuation-in-part of Ser. No. 216,192, Dec. 15, 1980, Pat. No. 4,155,198, which is a continuation of Ser. No. 128,821, Mar. 10, 1980, abandoned. This application Nov. 23, 1981, Ser. No. 323,914
Int. Cl.³ A01G 9/02
U.S. Cl. 47—85 9 Claims

1. A plant container fabricated of waterproof plastic sheet material and using no adhesive, said container comprising a

generally rectangular bottom wall, a side wall of four rectangular outer walls upstanding equally from and peripherally about said bottom wall and combining therewith to contain plant growing medium, a rectangular inner wall depending from the upper extremity of each outer wall on the inner side thereof to a predetermined elevation and a flap extending laterally inwardly from the lower edge of each inner wall with opposed flaps terminating in free edges proximate to and



spaced from each other to define a central passageway between said flap edges for the stem of a plant with its roots in the growing medium, said flaps being generally coplanar with each other spaced over said bottom wall and each having its opposite ends respectively under and over adjacent flaps to define an upper wall spaced a predetermined distance below the top of said side wall for receiving water to a depth of said distance with flow of excess water over said side wall to prevent overwatering.

4,439,951

GRINDING MACHINE

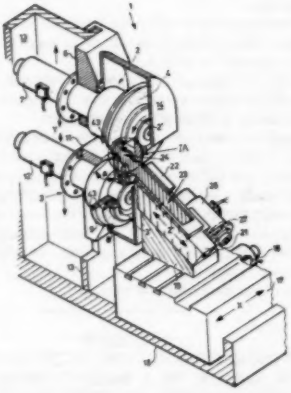
Peter Oppelt, Hamburg; Uwe Uhlig, Buchholz; Werner Redeker, Börnsen, and Werner Peschik, Neu-Börnsen, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,385

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027504

Int. Cl.³ B24B 7/00

U.S. Cl. 51—80 R **13 Claims**



1. In a grinding machine for the formation and/or treatment of concave and convex flanking surfaces in grooves in regions other than the bottoms of the grooves of turbine blades or analogous workpieces, the combination of a rotary spindle; a grinding wheel having a grinding periphery coaxial with and driven by said spindle; a base; a movable support on said base; first prime mover means operable to move said support in the course of a grinding operation in a first direction substantially at right angles to the axis of said spindle; a movable work holder on said support; second prime mover means operable to move said work holder in the course of a grinding operation in a second direction at right angles to said first direction, toward and away from the periphery of said grinding wheel, and at an acute angle to the axis of said spindle; and control means for operating said prime mover means to effect a composite movement of said work holder in a plane which makes said acute angle with said spindle for grinding said concave or convex surfaces, such composite movement having components in said first and second directions.

4,439,952

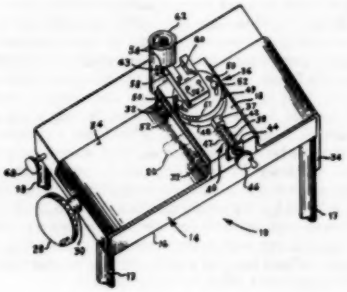
PORTABLE GRINDER ASSEMBLY

Gary G. Roberts, 1412 Bryant, Newport, Ark. 72112, and Calvin M. Swesey, 149 Glasgow Way, Vacaville, Calif. 95688

Filed Oct. 22, 1981, Ser. No. 313,863

Int. Cl.³ B24B 19/14

U.S. Cl. 51—93 **2 Claims**



1. A portable grinder assembly for use in grinding a component to a preselected size, said grinder assembly comprising:

a main support;

means operably connected to said main support for grinding said component, said grinding means including a vertically upstanding grinding element and air powered means for rotating said grinding element about is vertical axis;

means slidably mounted on said main support for positioning said component adjacent said grinding element and for permitting said component to be moved in three predetermined directions, said component positioning means including a fixture, said fixture containing a cut-out portion therein configured to accept an end of said component and for removably securing said component therein, first means connected to said fixture for permitting movement of said component to take place in a first predetermined direction and a second predetermined direction, and second means connected to said first movement permitting means for permitting movement of said component to take place in a third predetermined direction;

said first movement permitting means including a pair of elements, one of said elements being slidably mounted upon said second movement permitting means for permitting movement of said component to take place in said first predetermined direction and the other of said elements being slidably mounted upon said one element for permitting movement of said component to take place in said second predetermined direction;

said second movement permitting means being slidably mounted upon said main support for permitting movement of said component to take place in said third perdetermined direction and means operably connected to said second movement permitting means for moving said second movement permitting means a preselected distance;

said main support having an elongated, longitudinally extending slot formed therein adjacent said second movement permitting means, said means for moving said second movement permitting means having a portion thereof extending through said slot;

said second movement permitting means having means operably connected therewith for completely covering said slot in order to prevent grinding dust from entering said slot, said slot covering means including a pair of thin elastic sheets, each of said sheets being attached at one end thereof to said second movement permitting means, and each of said sheets simultaneously, continuously, completely covering said slot;

means encompassing said grinding element for cooling said component and said grinding element and protecting an operator of said grinder assembly from injury during operation thereof, said cooling and protecting means including an upstanding, cylindrically-shaped tube surrounding said vertically upstanding grinding element, said tube having a slot therein permitting said component to pass therethrough adjacent said grinding element; and

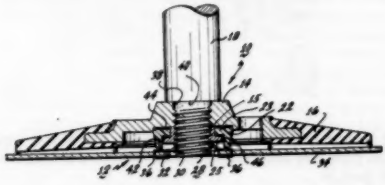
wherein said first predetermined direction is along a line transverse to said longitudinally extending slot, said second predetermined direction is about an axis perpendicular to the surface of said main support, and said third predetermined direction is along a line coincidential with said longitudinally extending slot.

4,439,953

ABRASIVE DISC HOLDER

Aleck Block, Los Angeles, and Hiroshi Hasegawa, Whittier, both of Calif., assignors to Merit Abrasive Products, Inc., Compton, Calif.

Filed Nov. 16, 1981, Ser. No. 321,583
Int. Cl.³ B24D *9/08*
U.S. Cl. 51—389 **10 Claims**



1. A holder for supporting an abrasive disc having a centrally located nut member and with the nut member including a flange portion located adjacent the disc and a thread portion extending from the flange portion, the holder including

a central metallic member,

a stud member extending through the central metallic member and including a threaded end portion,

a flexible pad portion supported by and extending radially outwardly from the central metallic member to support the abrasive disc,

a stop member composed of a low friction plastic material and with a first portion of the stop member disposed around and spaced from the threaded end portion of the stud member and spaced from the central metallic member and with a second portion of the stop member located adjacent to and spaced from the central metallic member and with the stop member captured in position for free rotation relative to the central metallic member and the stud member when the holder is non-supporting the abrasive disc, and

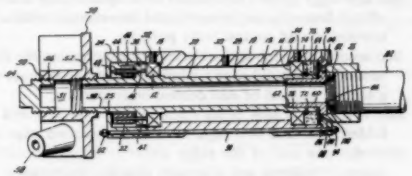
the threaded end portion of the stud member for receiving the thread portion of the nut member of the abrasive disc to thread the abrasive disc onto the holder and with the first portion of the stop member for abuting the flange portion of the nut member to compress the stop member to abut the central metallic member as the abrasive disc is threaded onto the holder.

4,439,954

SPIN BLAST TOOL

Percy J. Bennett, Houston, Tex., assignor to Clemtex, Inc., Houston, Tex.

Filed Dec. 31, 1981, Ser. No. 336,269
Int. Cl.³ B24C *3/32*; B05B *3/06*
U.S. Cl. 51—411 **11 Claims**



1. A sand blast tool comprising:

a body member having an aperture therethrough;

a conduit rotatably mounted within said aperture and having a bore therethrough;

a nozzle mounted on one end of said conduit;

said body member having connection means adapted for connecting said body member to a source of pressurized air and sand;

said conduit having its other end adjacent said connection means for receiving the pressurized air and sand;

a wear insert having a tubular body and a radial flange;

said other end of said conduit having a counterbore;

said tubular body received within said counterbore of said other end of said conduit and in rotating engagement therewith;

said radial flange extending around said other end;

sealing means disposed between said radial flange and said other end of said conduit;

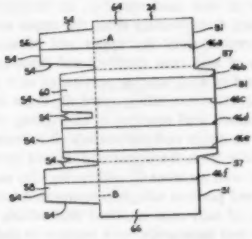
said tubular body having an inner diameter smaller than the inner diameter of said conduit and being made of a material more wear-resistant than the material of said conduit whereby said wear insert directs the stream of pressurized air and sand away from the internal surface of said bore and encounters the initial entry of said pressurized air and sand into said conduit.

4,439,955

ASPHALT COMPOSITION HIP AND RIDGE COVER

Bennie Freiborg, 4536 Indiana Ave., La Canada, Calif. 91011

Continuation-in-part of Ser. No. 188,876, Sep. 19, 1980. This application Sep. 8, 1981, Ser. No. 300,106
Int. Cl.³ E04D *1/20*
U.S. Cl. 52—57 **14 Claims**



1. An asphalt composition ridge cover comprising a unitary sheet of asphalt composition roofing material characterized by

a substrate of asphalt saturated felt and a layer of granules on the top surface thereof bonded to the saturated felt by a layer of asphalt, said ridge cover further comprising:

a generally rectangular central body portion having a first end, a second end, a first edge, a second edge and a longitudinal centerline;

a first pair of tabs integrally formed with said first end;

a first edge tab integrally formed with said first edge and a second edge tab integrally formed with said second edge;

a second pair of tabs coupled to said first edge tab and second edge tab respectively, proximate said first end, said second pair of tabs being shorter than said first pair of tabs;

said first edge tab and said means for increasing the thickness of said first edge tab being folded into contact with a first portion of said central body portion;

said second edge tab and said means for increasing the thickness of said second edge tab being folded into contact with a second portion of said central body portion;

said first pair of tabs being folded about said first end and folded over said first edge tab and said second edge tab;

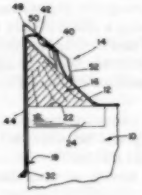
whereby one end of the ridge cover is provided with increased thickness and a smooth rounded appearance.

4,439,956

PRESS LOCK FASCIA-CANT SYSTEM

David C. House, Omaha, Nebr., assignor to Prawl Engineering Corporation, Omaha, Nebr.

Filed Aug. 2, 1982, Ser. No. 404,411
Int. Cl.[3] E04D 3/38; E04B 7/00
U.S. Cl. 52—60 1 Claim



1. A press lock fascia-cant system for installation on a building roof adjacent a wall, comprising,

a cant member secured to the roof adjacent the wall and having a right triangle section, said cant member including a flat bottom portion mounted on the roof and having inner and outer edges, said outer edge positioned in substantially the same plane as the wall, an outer wall portion extending upwardly from said outer edge, and an inclined wall portion extending downwardly and inwardly to the inner edge of said bottom portion,

a spring clip member secured to said cant member and comprising an outer wall member positioned outwardly of the outer wall portion of said cant member and having an upper end positioned at the upper end of said outer wall portion of said cant member, an inclined wall member extending downwardly from the upper end of said outer wall member over the upper end of said inclined wall portion of said cant member and terminating above the inner end of said bottom portion of said cant member, a spring portion extending upwardly from the lower end of said inclined wall member of said spring clip member and having an upper end portion which extends upwardly and outwardly from the upper end of said spring portion,

said outer wall member of said spring clip member having a lower end portion which is positioned below the bottom portion of said cant member and which extends downwardly and outwardly with respect to said cant member,

a fascia member detachably mounted on said spring clip member for maintaining a roof membrane therebetween,

said fascia member comprising an outer wall portion positioned adjacent the outer wall member of said spring clip member to maintain the roof membrane therebetween,

said outer wall portion of said fascia member having a substantially V-shaped lower end portion which receives the lower end portion of said outer wall member of said spring clip member,

said outwardly portion of said fascia member having an upper end which is positioned above the upper end of the outer wall member of said spring clip member,

said fascia member having a first inclined wall portion which extends downwardly and inwardly from the upper end of its said outer wall member over said spring portion whereby the roof membrane will be maintained therebetween,

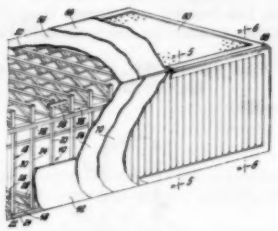
said fascia member having a second inclined wall portion which extends downwardly from the lower end of the first inclined wall portion for pressing the roof membrane into engagement with the cant member.

4,439,957

BUILDING STRUCTURE AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Benny O. Raasakka, 362 Wekiva Cove Rd., Longwood, Fla. 32779, and Alfred Evans, 6176 Miller Rd., Swartz Creek, Mich. 48473

Filed May 20, 1981, Ser. No. 265,685
Int. Cl.[3] E06B 1/04
U.S. Cl. 52—79.1 14 Claims



1. A box building module comprising a series of U-shaped stress members arranged in spaced serial order lengthwise of said module;

each stress member comprising a horizontally positioned truss and a pair of vertically extending elements;

said elements being positioned respectively at spaced locations along said truss and extending vertically along said truss and then above said truss a substantial distance;

the portion of each of said elements positioned along one of said trusses being secured thereto in load transmitting manner;

a horizontally extending vertically positioned sheath-like stress band extending along the full length of said series of stress members and secured in stress transmitting manner to said vertically extending elements thereof for a substantial portion of their vertical extent to form a rigid stress absorbing unitary side structure;

said horizontally positioned sheath-like stress band being received within notched portions of said vertically extending elements of said stress members;

said horizontally positioned stress band also being secured to the full height of said truss members at the connection thereto of said vertically extending elements of each of said U-shaped stress members;

a sheath member extending vertically along the full length of said U-shaped stress members and being affixed to said horizontally extending sheath-like stress band for the full extent thereof and to said vertically extending element for the full extent thereof above said horizontally disposed sheath-like stress band; and

an upper member joining said U-shaped stress members to form a roof means integrally connected to the upper ends of said U-shaped stress members and to form therewith a substantially rigid box-beam housing unit capable of spanning a substantial distance between supports.

4,439,958

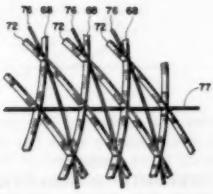
PRESTRESSED SELF-INTERLOCKING GRILLE STRUCTURE

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 58,556, Jul. 18, 1979, Pat. No. 4,282,695, and a continuation-in-part of Ser. No. 206,303, Nov. 12, 1980. This application Jun. 24, 1981, Ser. No. 276,956

Int. Cl.³ E04B *1/32*

U.S. Cl. 52—86 **5 Claims**



1. The curved shelter comprising in combination:

(a) a plurality of first kind of bars having first and second edges, each of which bars including a plurality of cutouts disposed along said first edge of said bars and further including one or more holes disposed intermediate each of two adjacent said cutouts, said bars curved to conform with a required surface geometry and disposed in a first direction;

(b) a plurality of second kind of bars having first and second edges, each of which bars including a plurality of cutouts disposed along the said second edge of said bars and further including one or more holes disposed intermediate each of two adjacent said cutouts, said bars curved to conform with a required surface geometry and disposed in a second direction criss-crossing said plurality of first kind of bars wherein each of said cutouts on said first kind of bars engages each of said cutouts on said second kind of bars; whereby, said pluralities of first and second kind of bars are assembled into a network of bars providing a plurality of series of said holes on said first and second kind of bars lined up in said first and second directions;

(c) a plurality of rods threaded through said plurality of series of holes lined up in said first and second directions;

(d) a flexible covering stretched over said network of bars; and

(e) a plurality of clips of U-shaped cross section clipped onto the edges of said first and second kind of bars holding down said flexible covering to said network of bars by the squeezing action.

4,439,959

RESIDENTIAL BUILDING CONSTRUCTION

Robert Helfman, 6682 Edgewood, Brighton, Mich. 48116

Filed Apr. 15, 1981, Ser. No. 254,535

Int. Cl.³ E04H *1/00*

U.S. Cl. 52—90 **6 Claims**

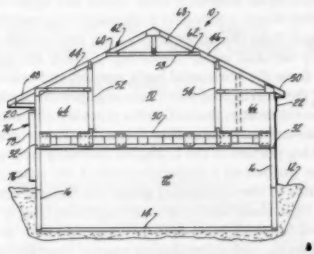
1. A residental building construction erected on a ground surface comprising:

four interconnected and generally vertically extending foundation walls, said foundation walls having a vertical length equal to the height of a conventional home living space and extending downwardly below the ground surface for substantially one-half of said height, said interconnected foundation walls being substantially rectangular in shape,

a floor disposed across and supported by said foundation walls so that said floor is spaced upwardly from the ground surface by substantially one-half of said length,

two side walls supported by and extending vertically upwardly from the opposed foundation walls and a front wall and a back wall supported by and extending vertically upwardly from the other two foundation walls, said side walls, back wall and front wall being interconnected together, said front and back wall having a height substantially equal to one-half said length,

a roof having two substantially rectangular halves disposed across and supported by said side walls, back wall and front wall, so that said rectangular halves abut together along one edge and form a roof peak, said roof halves declining downwardly from said roof peak at an angle so



that the vertical height of said building construction is substantially the same as a conventional one story house,

at least one window secured to said front wall, said window having a bottom spaced below the floor and a top spaced above the floor so that said window spans across the floor and provides an outward appearance of a conventional one-story ranch for the building construction, said window comprising light transmissive panes extending continuously from its top and to its bottom,

two interior walls extending vertically between said floor and said roof, one interior wall being spaced inwardly from but parallel to said front wall and the other interior wall being spaced inwardly from but parallel to said back wall, said interior walls and side walls together forming a living space of conventional height.

4,439,960

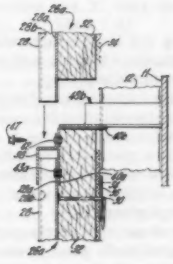
COMPOSITE INSULATION PANEL

Richard C. Jenkins, Overland Park, Kans., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 95,172, Nov. 19, 1979, abandoned. This application Oct. 30, 1981, Ser. No. 316,705

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—99 **3 Claims**



1. A prefabricated composite insulation panel useful in a plurality to cover the exterior of ductwork, precipitators, baghouses, hoppers, and other such components of coal-fired

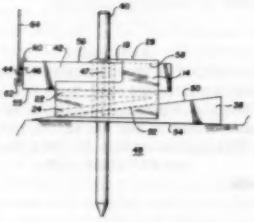
electric power generating plants, the panel comprising a generally rectangular corrugated sheet having a blanket of fibrous glass insulation secured thereto in engagement with inner corrugation extremities thereof, the blanket projecting upwardly beyond a normally upper edge of the corrugated sheet, an upper cap mounted on said corrugated sheet and including a generally Z-shaped flashing and an L-shaped fastening strip, the L-shaped fastening strip having a normally horizontal leg portion adjacent an upper edge of the blanket and a normally vertical leg portion extending downwardly from the horizontal leg portion on an outer side of the blanket and extending below the upper edge of the corrugated sheet into engagement with the inner corrugation extremities thereof, the generally Z-shaped flashing having a normally vertical inner upper leg portion secured to an upper portion of the vertical leg portion of the L-shaped fastening strip above the upper edge of the corrugated sheet, a normally horizontal body portion covering but spaced from the upper edge of the corrugated sheet, and a normally vertical outer lower leg portion extending downwardly from the horizontal body portion and below the upper edge of the corrugated sheet into engagement with outer corrugation extremities thereof, and a plurality of frangible temporary fasteners each extending through a lower portion of the vertical leg portion of the L-shaped fastening strip and through an upper portion of a respective one of the inner corrugation extremities of the corrugated sheet, the fasteners having sufficiently high shear and tensile strengths to fixedly secure the L-shaped fastening strip and the upper portion of the corrugated sheet to each other during normal handling of the panel before installation, yet having sufficiently low shear strength to fail by sheating due to thermal expansion of the corrugated sheet after installation of the panel in a manner fixedly securing the L-shaped fastening strip and the lower end portion of the corrugated sheet with respect to each other.

4,439,961

LEVELING AND LOCATING DEVICE AND METHOD OF USING

Donald H. Witte, 7331 Oakbluff, Dallas, Tex. 75240

Filed Nov. 3, 1981, Ser. No. 317,600
Int. Cl.³ E04D *15/00*; E04G *21/00*
U.S. Cl. 52—126.1 **10 Claims**



1. In a leveling and locating apparatus for vertically and horizontally positioning a member with respect to the earth, a force-bearing structure comprising:

a first wall means extending in a first plane;

a second wall means extending in a second plane, said second plane being substantially parallel to said first plane;

a first floor means operatively extending between said first and second wall means, said first floor means extending in a third plane which is at substantially right angles to said first and second planes;

a second floor means operatively extending between said first and second walls means, said second floor means extending in a fourth plane which is at substantially right angles to said first and second planes and is at a predetermined angle θ to said third plane, said predetermined angle θ being other than zero degrees, said second floor means being positioned on a first side of said first floor means;

a ceiling means operatively extending between said first and second wall means, said ceiling means extending in a fifth plane which is at substantially right angles to said first and second planes and is substantially parallel to said third plane, said ceiling means being positioned on a second side of said first floor means;

a first housing means, with opposed open ends, operatively attached to a first side of said second wall means and operatively positioned such that a centerline thereof is at substantially right angles to said first floor means,

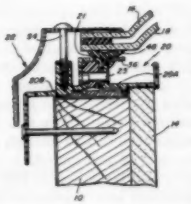
whereby said force bearing structure may be moved vertically along a vertical reference, by a force applied in a vertical direction to said second floor means.

4,439,962

SKYLIGHT CONSTRUCTION

Arthur P. Jentoft, Kennebunkport, and Paul A. Couture, Emery Mills, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Continuation-in-part of Ser. No. 923,245, Jul. 10, 1978, abandoned. This application Aug. 4, 1980, Ser. No. 175,306
Int. Cl.³ E04B *7/18*
U.S. Cl. 52—200 **15 Claims**



1. A skylight construction for an opening in a building comprising:

a curb frame extending about the opening and having means for securing the frame in a fixed position about the opening, said curb frame being of heat conductive material and having an inner section and an outer section,

transparent or translucent means covering the opening and extending at its edges to the curb frame,

means over the frame for retaining the covering means to the curb frame,

gasket means carried by said inner section of said curb frame,

means for securing said retaining means to said outer section of said curb frame to sandwich said transparent or translucent means between a portion of said retaining means and said gasket means, and

a low heat conductive plastic bridge disposed between said outer section and said inner section of said curb frame for impeding heat transfer through the curb frame,

said curb frame inner section and said curb frame outer section including respective facing walls, each having interlocking surfaces adapted to hold said plastic bridge in a position adjacent said gasket means and underlying said transparent or translucent means,

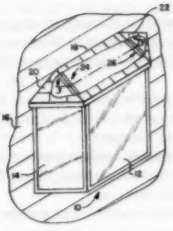
said curb frame having means supporting said gasket means by and over one of said facing walls.

4,439,963

BAY WINDOW PANEL JOINT

Stephen W. Feiss, Baltimore, Md., assignor to Fypon Inc., Stewartstown, Pa.

Filed Aug. 14, 1981, Ser. No. 293,008
Int. Cl.³ E06B 1/38
U.S. Cl. 52—201 7 Claims



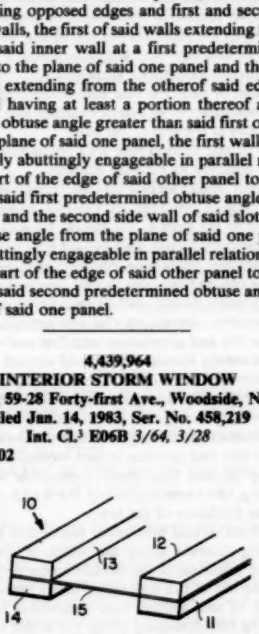
1. A bay window roof comprising a substantially planar center section panel and a pair of substantially planar flanker section panels, each of said panels being formed of unitary molded plastic material, and means for locating each one of said pair of flanker section panels with a side edge thereof abutting a corresponding side edge of said center section panel with said panels disposed at one of two predetermined obtuse angular positions with respect to each other, said locating means comprising a crescent shaped slot along the edge of one of said flanker and center section panels opening in the direction of the edge of the other of said panels, said slot having an inner wall having opposed edges and first and second spaced opposed side walls, the first of said walls extending from one of said edges of said inner wall at a first predetermined obtuse angle relative to the plane of said one panel and the second of said side walls extending from the otherof said edges of said inner wall and having at least a portion thereof at a second predetermined obtuse angle greater than said first obtuse angle relative to the plane of said one panel, the first wall of said slot being selectively abuttingly engageable in parallel relationship by one side part of the edge of said other panel to locate said other panel at said first predetermined obtuse angle relative to said one panel, and the second side wall of said slot which is at a greater obtuse angle from the plane of said one panel being selectively abuttingly engageable in parallel relationship by the opposite side part of the edge of said other panel to locate said other panel at said second predetermined obtuse angle relative to the plane of said one panel.

4,439,964

INTERIOR STORM WINDOW

Young Y. Chu, 59-28 Forty-first Ave., Woodside, N.Y. 11377

Filed Jan. 14, 1983, Ser. No. 458,219
Int. Cl.³ E06B 3/64, 3/28
U.S. Cl. 52—202 18 Claims



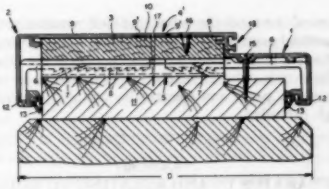
1. An insulating structure comprising:
a mounting frame for attachment to a stable structure adjacent a thermal opening, and
an insulating sheet for mounting on said mounting frame,
said mounting frame comprising first and second mounting strips each having two oppositely disposed adhesive surfaces,
said first mounting strip having a first adhesive surface for adhering said mounting frame to said stable structure and an oppositely disposed adhesive surface for connecting to said second mounting strip,
said second mounting strip having first and second adhesive mounting means for attachably mounting a portion of one surface of said insulating sheet to said stable structure.

4,439,965

FIRECODE DOOR-CASING ELEMENT

Günter Langenhorst, Bad Sassendorf, Fed. Rep. of Germany, assignor to top-element Bauelemente für Innenausbau + Raumgestaltung GmbH & Co. KG, Hamm, Fed. Rep. of Germany

Filed Jan. 19, 1982, Ser. No. 340,798
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1981, 3101551
Int. Cl.³ E06B 1/12
U.S. Cl. 52—211 9 Claims



1. A door-casing element comprising:
an elongated inner metallic profile;
an elongated outer metallic profile parallel to and spaced outward from said inner profile;
an elongated thermally relatively nonconductive connector between and engaging both of said profiles, said connector being formed with recesses open toward said profiles; and
means including respective tongues projecting transversely from said profiles and engaged in said recesses for securing said profiles in spaced-apart relationship to said connector with each of said profiles being securable to said connector at any of a plurality of transversely offset positions.

4,439,966

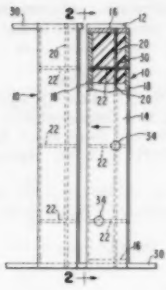
BUILDING MODULE HAVING INTERNAL TUBES FOR CARRYING ELECTRICAL WIRES

Alfred H. Alles, 260 Bridgeport Dr., El Granada, Calif. 94018

Continuation of Ser. No. 819,015, Jul. 25, 1977, abandoned, which is a continuation of Ser. No. 631,762, Oct. 13, 1975, abandoned. This application Apr. 27, 1981, Ser. No. 258,147
Int. Cl.³ E04B 5/48
U.S. Cl. 52—221 1 Claim

1. A building unit comprising: a pair of spaced, non-metallic side panels; a first pair of spaced end walls and a second pair of spaced end walls, the first and second pairs of end walls interconnecting and spanning the distance between the side panels at the outer peripheral margins thereof so that the side panels and the end walls present a hollow space between the side panels and form a building unit capable of being used with other such units to present a building construction, each end wall having a tube-receiving hole therethrough; a pair of generally perpendicular, paperbased tubes in the space between the side panels, one tube spanning the distance between and frictionally received at the ends thereof in respective holes of the first pair of end walls, the other tube spanning the distance between and frictionally received at the ends thereof in respective holes of the second pair of end walls, the tubes being in

generally parallel planes adjacent to each other at a location between the side panels, the ends of the tubes being open and substantially flush with outer surfaces of respective end walls to allow wiring to be directed into either end of each tube; and a mass of insulation material in said space and bonded to the inner surfaces of said side panels and end walls and to the outer



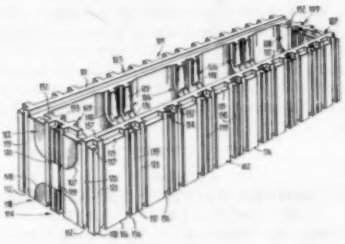
surfaces of the tube, the tubes, the side panels and said insulation material mass being of materials capable of being cut when the tubes are in said space to permit access to the tubes intermediate their ends, whereby electrical fixtures can be mounted on said one side panel and electrically coupled to wires running through the tubes.

4,439,967

APPARATUS IN AND RELATING TO BUILDING FORMWORK

Olif F. Dielenberg, Victoria, Australia, assignor to Isorast Thermacell (U.S.A.), Inc., City of Industry, Calif.

Filed Mar. 15, 1982, Ser. No. 358,024
Int. Cl.³ E04C *2/04*
U.S. Cl. 52—309.12 **5 Claims**



1. A building block formwork element to be used in building a structure, comprising:

a. a hollow rectangular shaped block member having first and second oppositely disposed parallel side walls and first and second oppositely disposed parallel end walls;

b. said first side wall containing a multiplicity of mating grooves and ribs which extend along the height of the wall;

c. said second side wall containing a multiplicity of mating grooves and ribs which extend along the height of the wall;

d. said first end wall containing a multiplicity of mating grooves which extend along the height of the wall;

e. said second end wall containing a multiplicity of ribs which extend along the height of the wall and correspond to the multiplicity of mating grooves in the first end wall;

f. said second end wall containing a multiplicity of mating grooves which extend along the height of the wall;

g. said first end wall containing a multiplicity of ribs which extend along the height of the wall and correspond to the multiplicity of mating grooves in the second end wall;

h. the ribs and grooves in said first and second end wall also corresponding to selected grooves and ribs in said first and second side walls;

i. said first end wall containing an upper arcuate cut-out portion extending downwardly from its top and a lower arcuate cut-out portion extending upwardly form its bottom;

j. said second end wall containing an upper arcuate cut-out portion extending downwardly from its top and a lower arcuate cut-out portion extending upwardly from its bottom;

k. a first upper removable insert member corresponding to the upper arcuate cut-out portion of said first end wall and removably inserted therein;

l. a first lower removable insert member corresponding to the lower arcuate cut-out portion of said first end wall and removably inserted therein;

m. a second upper removable insert member corresponding to the upper arcuate cut-out portion of said second end wall and removably inserted therein;

n. a second lower removable insert member corresponding to the lower arcuate cut-out portion of said second end wall and removably inserted therein;

o. the top of said first side wall containing a longitudinal ridge extending the length of the wall;

p. the bottom of said first side wall containing a longitudinal groove extending the length of the wall and corresponding to the ridge on the top of the wall;

q. the top of said second side wall containing a longitudinal ridge extending the length of the wall;

r. the bottom of said second side wall containing a longitudinal groove extending the length of the wall and corresponding to the ridge on the top of the wall;

s. the top of said first side wall containing a multiplicity of slots adjacent its exterior surface;

t. the bottom of said first side wall containing a multiplicity of tongues adjacent its exterior surface and corresponding to the slots at the top of the wall;

u. the top of said second side wall containing a multiplicity of slots adjacent its exterior surface;

v. the bottom of said second side wall containing a multiplicity of tongues adjacent its exterior surface and corresponding to the slots at the top of the wall;

w. the outwardly facing wall of said first upper removable insert member containing ribs and grooves in alignment with the ribs and grooves in said first end wall;

x. the outwardly facing wall of said first lower removable insert member containing ribs and grooves in alignment with the ribs and grooves in said first end wall;

y. The outwardly facing wall of said second upper removable insert member containing ribs and grooves in alignment with the ribs and grooves in said second end wall;

z. the outwardly facing wall of said second lower removable insert member containing ribs and grooves in alignment with the ribs and grooves in said second end wall;

aa. the top of said first upper removable insert member containing ribs extending along the width of the top and along the thickness of the top;

bb. the bottom of said first lower removable insert member containing grooves along the width of the bottom and along the thickness of the bottom to correspond with the ribs at the top of the first upper insert member;

cc. the top of said second uper removable insert member containing ribs extending along the width of the top and along the thickness of the top;

dd. the bottom of said second lower removable insert member containing grooves along the width of the bottom and along the thickness of the bottom to correspond with the ribs at the top of the second upper insert member;

ee. the arrangement of ribs and grooves in the first and second side walls, first and second end walls, first and

second upper removable insert members, and the first and second lower removable insert members being arranged so that adjacent blocks can be interlocked end to end, end to side, in complete alignment with top to bottom or offset in alignment with a portion of the bottom interlocked with each of two adjacent tops;

ff. said hollow rectangular shaped block further comprising a multiplicity of transverse walls disposed between said first and said second side walls to thereby form a multiplicity of chambers within the block;

gg. each of said transverse walls containing an upper arcuate recess corresponding to the upper arcuate recess in the first and second end walls;

hh. each of said transverse walls containing a lower arcuate recess corresponding to the lower arcuate recess in the first and second end walls; and

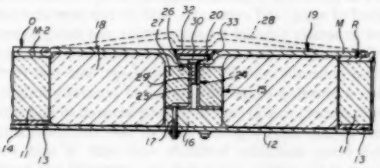
ii. said first and second end walls and said transverse walls containing aligned grooves in their upper arcuate recess portions.

4,439,968

PRE-STRESSED THERMAL PROTECTION SYSTEMS

Thomas J. Dunn, Pasadena, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 15, 1982, Ser. No. 418,137
Int. Cl.³ E04B 1/74; B32B 9/04
U.S. Cl. 52—404 **9 Claims**



1. A reusable high temperature, thermal protection system for a vehicle substructure comprising a plurality of spacer bars secured in pocket forming groups on the vehicle substructure, packing of low density insulation in each pocket, an outwardly dished protective panel of high temperature resistant, resilient material surmounting each pocket, and means flexing the central portion of each panel toward said substructure for prestressing each panel and pressing the periphery thereof firmly against the surrounding spacer bars.

4,439,969

DEVICE FOR AFFIXING PANELS IN ABUTTING RELATIONSHIP TO A SUPPORT STRUCTURE

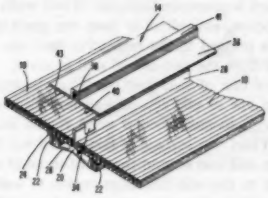
Gary F. Bartlett, G. F. Bartlett & Associates, Rose Hill Rd., R.D. #3, Muncy, Pa. 17756

Filed Oct. 28, 1981, Ser. No. 315,910
Int. Cl.³ E04C 1/34
U.S. Cl. 52—461 **4 Claims**

1. A device for affixing two adjacent panels to a support structure, said device comprising:

(a) an elongated, extruded metal base member having an axial length and transverse width, said base member including means for engaging the under side of each of said panels, said engaging means contacting each of said panels at at least two transversely spaced, axially elongated contacting areas, said contacting areas being arranged in two groups, each of said groups of contacting areas defining a generally planar surface, said base member further including an integral, axially elongated locking projection having a height in excess of the thickness of said panels, the distal edge of said locking projection having an elongated bead, said base member further including means for affixing said base member to said support structure, said affixing means comprising means for receiving headed fasteners between said contacting areas;

(b) an elongated, substantially rigid extruded metal cap member having an axial length and transverse width, said cap member including an integral, axially elongated slot for engaging said locking projection, said cap member further including axially elongated co-planar panel contacting areas on each side of said slot disposed to contact



the upper surface of said panels and adapted to retain the panels on the base members while enabling differential thermal expansion and contraction of the panel, base member and cap, said panel contacting areas overlying said axially elongated contacting areas of the base member; and

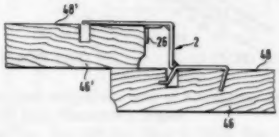
(c) a plurality of U-shaped metal clip fasteners engaged and held on the bead on the distal edge of said locking projection in spaced-apart relation for securing said locking projection into said slot.

4,439,970

RETAINER FOR THE ATTACHMENT OF PANELING ELEMENTS, PANELING STRUCTURE PRODUCED BY USING THE RETAINER AND PANELING STRIP SUITABLE FOR USE OF THE RETAINER

Wolfgang Rosner, Josephsburgstr. 73a, D-8000 München 80, Fed. Rep. of Germany

Filed Jan. 12, 1981, Ser. No. 224,038
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 3001446
Int. Cl.³ E04B 1/38; E04D 1/34, 3/36
U.S. Cl. 52—511 **7 Claims**



1. A paneling structure, including paneling elements of wood, plastic or the like, of the overlapping arrangement type, comprising elongated first paneling elements spaced farther away from the surface to be paneled and elongated second paneling elements closer to the surface to be paneled, said paneling elements having first and opposite second edge regions and being supported by a supporting structure in such a manner that first edge regions of said second paneling elements are adjacent to second edge regions of said first paneling elements and that second edge regions of said second paneling elements are adjacent to first edge regions of said first paneling elements, wherein:

(a) at least said first paneling elements comprising at their rear surfaces at least first and second longitudinally extending grooves having two walls, each of said first grooves being provided at a respective said first edge

region and each of said second grooves being provided at a respective said second edge region;

(b) a plurality of substantially Z-shaped retainers, each having a first shank, a second shank and a central bar connecting said first and said second shank, are attached in spaced relationship along said first and second edge regions to the said rear surfaces of said first paneling elements such that said second shanks are directed towards adjacent said second paneling elements;

(c) said retainers comprise at their respective said first shank at least one engagement projection having an engagement end which is penetrated into one of said walls of one of the said grooves, as well as at least one press-in projection, which is pressed to the respective said rear surface at a distance from the said one of said grooves;

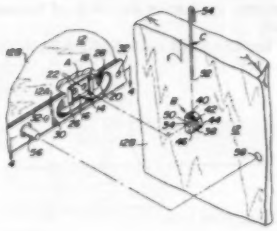
(d) pairs of one of said first paneling elements and of an adjacent one of said second paneling elements, which is fitted with its said second edge region into the space between said rear surface of said one of said first paneling elements and said second shanks of those of said retainers attached to the said first edge region of said one of said first paneling elements, are secured to said supporting structure by fitting said one of said second paneling elements with its first edge region into the space between said rear surface of an oppositely adjacent one of said first paneling elements and said second shanks of those of said retainers attached to the said second edge region of said oppositely adjacent one of said paneling elements and by securing said second edge region of said one of said first paneling elements to said supporting structure by means of those of said retainers attached thereto.

4,439,971

PANEL CONNECTOR

John S. Rutherford, Chalfont, Pa., assignor to Woodrite, Inc., Willow Grove, Pa.

Filed Mar. 24, 1982, Ser. No. 361,345
Int. Cl.³ E04C *1/10*
U.S. Cl. 52—584 **13 Claims**



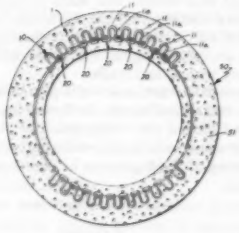
1. A concealed connector for coupling two panel sections together comprising a first member mounted within a recess within an edge of one panel section and including a lip extending partially into the recess, and a second member outwardly projecting from a surface of the second panel section and being rotatably coupled with respect thereto on an axis substantially normal to the surface thereof, said second member including an externally threaded cam portion adapted to protrude within the recess of the first panel section when the two panel sections are abutted, and means for rotating said second member at the periphery thereof adjacent the surface of the second panel section so that a segment of said threaded cam portion will engage said lip and draw the abutting surfaces of the two panel sections in tight locked disposition with the connector retained invisibly therebetween.

4,439,972

CIRCUMFERENTIAL STIRRUP PANEL

Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423

Division of Ser. No. 265,443, May 20, 1981, Pat. No. 4,345,626, which is a continuation of Ser. No. 36,171, May 4, 1979. This application Mar. 8, 1982, Ser. No. 356,048
Int. Cl.³ E04H *12/00*
U.S. Cl. 52—651 **10 Claims**



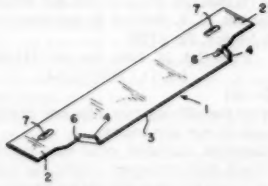
1. A concrete pipe reinforcing cage and stirrup reinforcement assembly comprising: a generally cylindrical reinforcing cage including circumferential wires extending around said cage and generally longitudinal wires extending longitudinally with respect to said cage and being joined to said circumferential wires; a mat joined to said cage which is comprised of a plurality of generally sinusoidal shaped stirrup members, each comprised of nodes and antenodes, said stirrup members being oriented generally parallel to one another and being oriented circumferentially with respect to said cage with said nodes projecting generally radially from said cage, said mat further including a plurality of tie wires oriented generally longitudinally with respect to said cage and being secured to said stirrup members to join them together each of said sinusoidal stirrup members being manually bendable and each of said nodes being open at the bottom and being open between one another in a given stirrup member, except where joined by said antenodes, whereby said mat can be manually, arcuately shaped along the length of said sinusoidal stirrup members to conform to the circumference of said cage.

4,439,973

CLIP FOR METAL PLANKS

Martin Nassof, Cliffside Park, N.J., assignor to Simplex Ceiling Corp., Hoboken, N.J.

Filed Jul. 10, 1981, Ser. No. 282,064
Int. Cl.³ F04B *1/38, 5/52*
U.S. Cl. 52—714 **4 Claims**



1. A clip for attachment of metal planking to a T-bar, which comprises an elongated main body having parallel sides, a generally trapezoidal projecting portion, and an intermediate portion integral with and joining the longer base of said trapezoidal portion to a side of said main body portion, all of said portions being coplanar and the bases of said trapezoidal portion being parallel to said main body sides, said intermediate portion being shorter than said longer base to define a pair of

opposed open slots between said projecting portion and said main body portion for receiving the edges of a metal plank; said intermediate portion having opposed, integral movable tab means at each end thereof, said tabs being bent away from the plane of said coplanar portions and operable to be manually bent towards or away from said plane to shorten or lengthen, respectively, its associated slot; and an elongated ear normal to and integral with said trapezoidal portion at each inclined side thereof and extending from the longer base to the shorter base thereof, each said ear being operable, when one edge of a plank is secured in a slot and the free edge of the plank is manually pushed against said ear, to cam the free edge of a plank across said ear and into said slot.

4,439,974

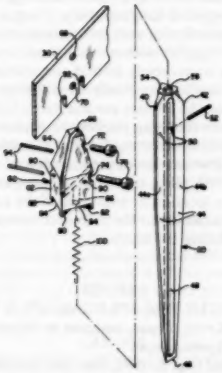
GUIDE MECHANISM AND FINGER

John A. Wiseman, Lynchburg, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Continuation-in-part of Ser. No. 278,000, Jun. 26, 1981, and Ser. No. 309,671, Oct. 8, 1981, abandoned. This application Jan. 27, 1982, Ser. No. 343,371

Int. Cl.³ B65B *32/02, 5/08*

U.S. Cl. 53—248 **46 Claims**



1. In a guide mechanism for use in an article-loading machine having means for positioning articles in predetermined juxtaposition above said guide mechanism and means for positioning an article-receiving receptacle below said guide mechanism, said guide mechanism comprising a plurality of elongated support members defining a generally horizontal grid, and a plurality of mounting members spaced along said support members to define passages through which the articles pass downwardly into the receptacle; the improvement wherein said mounting members have bottom surfaces and said guide mechanism further comprises elongated downwardly-extending guide member fingers having top surfaces defining a fulcrum and spring means acting substantially vertically in tension to resiliently contact each finger with a respective mounting member to force pivotal engagement of the fulcrums on the top surfaces of said fingers against the bottom surfaces of said mounting members and to simultaneously hold said fingers in position below said mounting members; said finger top surfaces and fulcrums defined thereon, said bottom surfaces of the mounting members and said spring means cooperating so that the lower ends of said fingers normally are urged by said spring means to extend inwardly towards the centers of said passages for engaging articles before the articles are dropped through said passages and pivot outwardly towards the periphery of said passages against the action of said spring means as the articles pass through said passages into the receptacle.

4,439,975

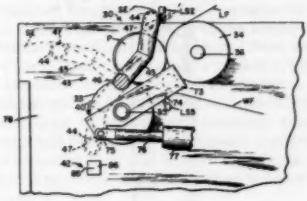
METHOD OF AND APPARATUS FOR WRAPPING PRODUCTS

Robert Laing, Sutton, Mass., assignor to Curtis & Marble Corp., Worcester, Mass.

Division of Ser. No. 937,055, Aug. 28, 1978, Pat. No. 4,189,894. This application Dec. 10, 1979, Ser. No. 101,737

Int. Cl.³ B65B *11/04, 11/58*

U.S. Cl. 53—399 **6 Claims**



1. Method of wrapping a generally cylindrical product with plastic film having sufficient softness and frictional characteristics for enabling the film to adhere to the surface of the product upon contact therewith, the product being wrapped on a pair of spaced elongated support rolls forming an upper supporting nip for supporting the product in a generally horizontal position, the method comprising the following steps:

(a) extending the free end of a wrapping film upwardly from a first supply roll between the support rolls and over one of the support rolls to a cut-off line spaced from said one support roll,

(b) extending the free end of a relatively narrow starter film from a supply roll, first over the other of said pair of support rolls then over said wrapping film covering said one support roll to the cut-off line,

(c) placing the product on the wrapping and starter films covering the pair of support rolls within said supporting nip,

(d) transferring the free ends of the wrapping and starting films to the product, and

(e) rotating the product in one direction within the nip about its central longitudinal axis while guiding the free leading ends of the wrapping and starter films into the nip between the product and said other roll by the portion of the starter film extending between and over the support roll to wrap the wrapping and starter films around the product.

4,439,976

METHOD FOR FILLING GAS INTO A METAL CONTAINER

Soeda Yuji, and Akio Goto, both of Kanagawa, Japan, assignors to Tokico Ltd., Kanagawa, Japan

Division of Ser. No. 148,490, May 9, 1980, Pat. No. 4,361,248. This application Aug. 31, 1982, Ser. No. 413,433

Claims priority, application Japan, May 21, 1979, 54-62515

Int. Cl.³ B65B *31/04*

U.S. Cl. 53—403 **4 Claims**

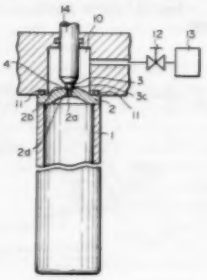
1. A method of filling pressurized gas into a metal container, said method comprising:

deforming outwardly a portion of a wall of the metal container and thereby causing fracture of said wall along two fractured surfaces while projecting said portion outwardly from the remainder of said wall between said two fractured surfaces with said portion being integrally connected to said remainder of said wall at opposite ends of said two fractured surfaces, and thereby forming gas introducing passages between said two fractured surfaces and respective fractured side surfaces of said projecting portion, said deforming comprising the forming of said projecting portion with increasing thickness in a direction

transverse to said side surfaces thereof in a direction outwardly of said container;

supplying pressurized gas into the interior of said container through said gas introducing passages;

deforming inwardly said projecting portion by applying thereto a pressing force to return said projection into the



wall opening created by said outward deformation and re-engage said fractured surfaces and said respective side surfaces, thereby closing said gas introducing passages; and

permanently securing the thus inwardly deformed projecting portion to said remainder of said wall.

4,439,977

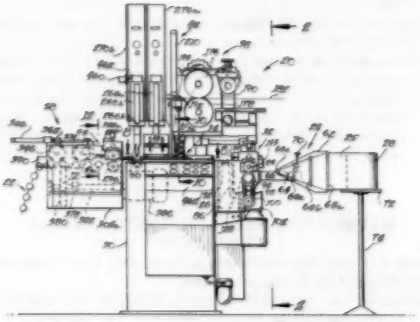
METHOD AND APPARATUS FOR MAKING A SERIES OF POCKETED COIL SPRINGS

Walter Stumpf, Munster, Ind., assignor to Simmons U.S.A. Corporation, Atlanta, Ga.

Continuation of Ser. No. 793,949, May 5, 1977, abandoned. This application Jul. 16, 1981, Ser. No. 284,240

Int. Cl.[3] **B29C** *27/08;* **B32B** *31/20;* **B65B** *35/56*

U.S. Cl. 53—428 **20 Claims**



1. Apparatus for making a series of coil springs pocketed within an elongate stretchable fabric strip comprised of at least two overlying plies capable of being thermally welded together, said apparatus comprising, in combination, means defining a guide path adapted to receive said fabric strip for longitudinal movement therealong, indexing drive means operative to engage and to advance said fabric strip intermittently along said guide path, inserter means adjacent said guide path means and operative to deposit a compressed coil spring between said plies, first thermal weld head means operatively associated with said guide path means and operative to thermally weld said two plies together along at least one weld line longitudinally of said strip adjacent to the edge thereof into which the spring is inserted, second thermal weld head means operatively associated with said guide path means and adapted to thermally weld said two plies together along weld lines transversely of said strip between successive springs, said weld lines defining an individual spring retaining pocket about each of said inserted springs, both of said thermal weld head means being positioned adjacent to said inserter means along said guide path in the direction of movement of said fabric strip to hold the stretchable fabric strip during the insertion of spring between the plies, said first and second weld heads being disposed adjacent to each other and being operated simultaneously to complete the spring retaining pocket at a location immediately adjacent and downstream of said inserter means, means associated with said guide path to maintain said springs in compression between said two plies until after the operation of said weld head means, and control means operatively associated with said indexing drive means, said inserter means, and said first and second weld head means operable to effect operation of said inserter means and said weld head means in unison and in alternate relation with said indexing drive means so as to insert the springs and to form the pockets while said fabric strip is intermittently at rest.

14. A method for making a series of connected pocketed coil springs comprising the steps of intermittently advancing two overlying plies of thermally weldable fabric strip along a predetermined guide path, successively inserting a plurality of compressed coil springs between said two overlying plies of thermally weldable fabric strip when said strip is at rest so that said springs are spaced longitudinally along said strip, maintaining the compression of said springs and thermally welding said fabric plies together with contact pressure simultaneously along weld lines transversely of said strip between successive inserted springs and longitudinally of said strip along the edge thereof into which the springs are inserted when said strip is at rest so as to form a retaining pocket about each of said springs while the springs are compressed and at a location immediately adjacent to and downstream of the insertion of the compressed spring between the plies, said contact pressure holding said edge in place at a location downstream in the advancing direction and closely adjacent to the path of movement of the compressed spring during its insertion.

4,439,978

APPARATUS FOR SPLICING SPUN YARNS

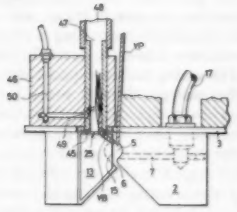
Hiroshi Mima, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 2, 1982, Ser. No. 414,306

Claims priority, application Japan, Sep. 3, 1981, 56-139099

Int. Cl.[3] **D01H** *15/00*

U.S. Cl. 57—22 **3 Claims**

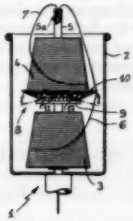


1. An apparatus for splicing spun yarns, which comprises a splicing member having a splicing hole and a jet nozzle for jetting a compressed fluid into said splicing hole, and control nozzles arranged on both the outer sides of said splicing hole to suck yarn ends to be spliced, said splicing apparatus being characterized in that a cylindrical sleeve having an inclined jet hole formed on the tubular wall thereof to extend to the interior of the cylinder and to be communicated with an air introducing hole is fitted in a nozzle hole of said control nozzle slidably in the axial direction thereof so that the position of the jet hole relative to the yarn ends can appropriately be changed.

4,439,979
DOUBLE TWIST SPINDLE ASSEMBLY

Roland Winkelmann, Caluire, France, assignor to Verdol S.A., Caluire, France

Filed Apr. 28, 1982, Ser. No. 372,863
Claims priority, application France, Apr. 30, 1981, 81 08833
Int. Cl.³ D01H *7/86, 13/10, 13/12*
U.S. Cl. 57—58.86 **8 Claims**



1. In a double twist spindle assembly of the type including a central spindle having a bore therethrough and extending through a can and the spindle supporting within the can a lower yarn package and an upper yarn package each feeding yarn into the bore of the spindle above the packages, an improved device for guiding the yarn which is unwinding from the lower package to prevent its contacting the upper package, the improved device comprising:

(a) a disc supported on the spindle radially disposed between the packages;

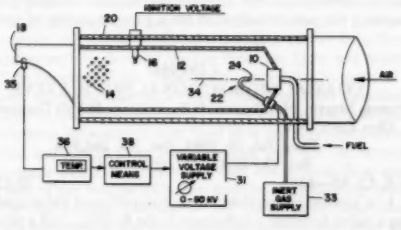
(b) multiple leaf means pivotally supported on the disc and including outer peripheries extending from the disc and operative to contact the yarn as it unwinds from the lower package and guide it outwardly away from the periphery of the upper package; and

(c) the leaf means having means maintaining contact with the outer periphery of the upper package and operative to close the leaf means to decrease the diameter of its periphery independently of the tension of the yarn as the diameter of the outer yarn layer of the upper package decreases.

4,439,980
ELECTROHYDRODYNAMIC (EHD) CONTROL OF FUEL INJECTION IN GAS TURBINES

Oscar Biblarz; James A. Miller, both of Carmel, and Ronald J. Laib, Bonita, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 16, 1981, Ser. No. 321,955
Int. Cl.³ F02C *7/22*
U.S. Cl. 60—39.06 **10 Claims**



1. In a gas turbine engine wherein the fuel is injected through a spray injection nozzle into a combustion chamber, the improvement being apparatus for modifying the normal spray characteristics of the injected fuel so that fuels of higher aromatic content can be efficiently used in said engine, which comprises means for providing a variable electrostatic field within said combustion chamber in the vicinity of said injection nozzle, the fuel emerging from said nozzle being charged by said electrostatic field, whereby the spray characteristics of said fuel spray may be modified by adjusting the strength of the electrostatic field, said means for providing an electrostatic field including:

(a) an electrical conductor disposed in the pathh of said injected fuel spray;

(b) means for supplying a variable high voltage to said conductor;

(c) a first layer of high density insulating material covering said conductor for protecting said conductor from damage due to the high temperatures in the combustion unit and electrically insulating said conductor from the ground plane of the combustion chamber, a portion of the surface of said conductor being uncovered to provide an exposed high voltage surface for providing said electrostatic field;

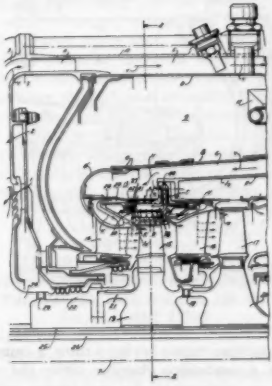
(d) a second layer of high density insulating material disposed over said first layer of high density insulating material and separated from said layer of high density insulating material so that a passage is formed between the two layers; and

(e) a source of inert gas coupled to said passage to provide a protective layer to insulate the exposed surface of the conductor from the flame.

4,439,981
ARRANGEMENT FOR MAINTAINING CLEARANCES BETWEEN A TURBINE ROTOR AND CASING

Wolfgang Weiler, and Klaus Trappmann, both of Dachau, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 122,086, Feb. 19, 1980, abandoned.
This application Jun. 30, 1982, Ser. No. 393,919
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907749
Int. Cl.³ F02C *7/18;* **F01D** *11/08, 25/12*
U.S. Cl. 60—39.32 **1 Claim**



1. In a gas turbine engine having a rotor, a casing surrounding the rotor, a combustion chamber within the casing, and a compressor, an arrangement for maintaining minimal clearances between the radially-outermost surfaces of the turbine rotor and the turbine casing surrounding the rotor, the arrangement comprising:

(a) an annular sleeve surrounding the turbine rotor and fixed with respect to the turbine casing, the sleeve being elastically deformable in a radial direction,

(b) a wear ring carried by the deformable sleeve, the wear ring being composed of segments arranged end-to-end circumferentially, the adjacent ends of the segments being spaced apart when the engine is cold or idling, the spaces

between the segments closing and the segment ends engaging each other within one operating range of temperatures of the engine, and the sleeve expanding radially within a higher operating range of temperatures of the engine,

(c) duct means for conducting air from the outlet of the compressor, the deformable sleeve being mounted on the duct means and the duct means forming part of the combustion chamber of the engine, one wall of the duct means having a forked section,

(d) an annular perforated sleeve surrounding and connected to the deformable sleeeve, air from the duct flowing through the perforations in the perforated sleeve and thereby being directed against the deformable sleeve,

(e) means for directing air from the duct against the wear ring,

(f) an annular deflector connected to the perforated sleeve, the deflector defining an end of the duct and being loosely retained within the forked section of the duct, and

(g) layers of thermal insulation on the duct means and on the surface of the wear ring facing the rotor blades, the insulation being of ceramic material.

4,439,982

ARRANGEMENT FOR MAINTAINING CLEARANCES BETWEEN A TURBINE ROTOR AND CASING

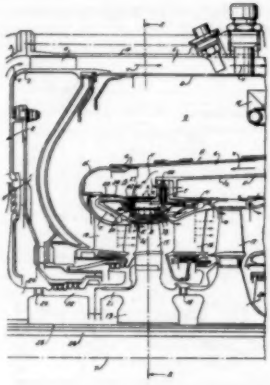
Wolfgang Weiler, and Klaus Trappmann, both of Dachau, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 122,087, Feb. 19, 1980, abandoned. This application Jun. 30, 1982, Ser. No. 393,920

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907748

Int. Cl.³ F02C *7/18*; F01D *11/08, 25/12*

U.S. Cl. 60—39.32 **1 Claim**



1. In a gas turbine engine having a rotor, a casing surrounding the rotor, a combustion chamber within the casing, and a compressor, an arrangement for maintaining minimal clearances between the radially-outermost surfaces of the turbine rotor and the turbine casing surrounding the rotor, the arrangement comprising:

(a) an annular sleeve surrounding the turbine rotor and fixed with respect to the turbine casing, the sleeve being elastically deformable in a radial direction,

(b) a wear ring carried by the deformable sleeve, the wear ring being composed of segments arranged end-to-end circumferentially, the adjacent ends of the segments being spaced apart at all operating conditions of the turbine,

(c) duct means for conducting air from the outlet of the compressor, the deformable sleeve being mounted on the duct means and the duct means forming part of the combustion chamber of the engine, one wall of the duct means having a forked section,

(d) an annular perforated sleeve surrounding and connected to the deformable sleeve, air from the duct flowing through the perforations in the perforated sleeve and thereby being directed against the deformable sleeve,

(e) means for directing air from the duct against the wear ring,

(f) an annular deflector connected to the perforated sleeve, the deflector defining an end of the duct and being loosely retained within the forked section of the duct, and

(g) layers of thermal insulation on the duct means and on the surface of the wear ring facing the rotor blades, the insulation being of ceramic material.

4,439,983

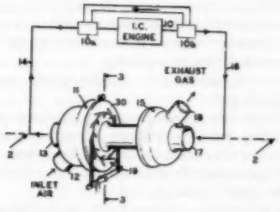
INLET TURBINE POWERED EXHAUST EXTRACTOR FOR INTERNAL COMBUSTION ENGINES

David C. Gertz, 7523 Quailwood Way, Citrus Heights, Calif. 95610

Continuation of Ser. No. 959,788, Nov. 13, 1978, abandoned. This application Nov. 9, 1981, Ser. No. 319,449

Int. Cl.³ F02B *35/02*

U.S. Cl. 60—273 **3 Claims**



1. A method of improving the efficiency of a four-cycle internal combustion engine, including, in combination, the steps of:

(a) isentropically expanding inlet air to said engine by passing the air through an inlet turbine having an inlet annulus of larger diameter than the diameter of its outlet annulus such that power is extracted from the inlet air to drive the turbine;

(b) decreasing the exhaust gas back pressure from said engine by passing the exhaust gas through a driven outlet compressor having an inlet annulus of smaller diameter than the diameter of its outlet annulus; and

(c) driving said outlet compressor directly by said turbine whereby the overall temperature of the internal combustion cycle is lower than in the absence of said turbine and compressor to thereby increase the thermodynamic efficiency by increasing the power delivered for a given quantity of fuel.

4,439,984

COAXIAL BIDIRECTIONAL SPOOL VALVE

Francis Martin, Huntington, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

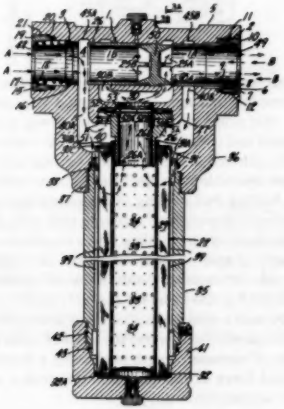
Filed Jul. 20, 1981, Ser. No. 284,908

Int. Cl.³ B01D *27/10*; F16K *17/26*

U.S. Cl. 60—454 **25 Claims**

1. A coaxial bidirectional flow control spool valve comprising a valve housing; a valve seat in the housing; and a plurality of fluid flow passages in the housing; the valve comprising, as valve elements, a spool valve and first and second bungee followers, each reciprocating between two limiting positions along a longitudinal axis, the spool valve moving into and away from actuating contact with a bungee follower in each of its two limiting positions, the spool valve and one of each of the bungee followers being linked in each of the limiting posi-

tions in their response to fluid flow, so that when the spool valve is in one position, it together with one bungee follower accepts flow from one direction in a fluid line and directs it through one path to a unidirectional function and through one path from the unidirectional function, receiving and returning the flow to the fluid line continuing in the same direction, and when the spool valve is in actuating contact with the other bungee follower, in the other limiting position, the valve and bungee follower accept flow through the fluid line from the opposite direction, and direct it through the same fluid path to the unidirectional function and also accept flow from the same path from the unidirectional function and direct this flow back into the fluid line continuing in the same opposite direction; the reciprocable spool valve having side sealing surfaces, and being reciprocable in the housing between first and second limiting positions, respectively, along the valve seat; a fluid pressure-receiving surface operatively connected to one side of the reciprocable spool valve; and a second fluid pressure-receiving surface operatively connected to the opposed side of the spool valve; differential fluid pressure arising from fluid flow in either direction in the fluid line applied to the first and second pressure-receiving surfaces urging the valve in opposite directions, towards or away from one of its limiting positions; the first and second bungee followers each being disposed in the housing to be actuated in one of the limiting positions of the



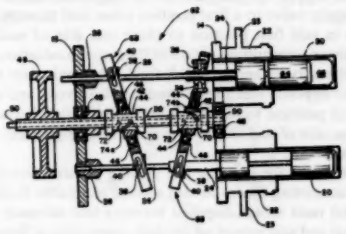
reciprocating spool valve, the first bungee follower being actuated by the spool valve in its first position, and the second bungee follower being actuated by the spool valve in its second position; first and second bias means urging the first and second bungee followers, respectively, in one direction, and the second valve urging the bungee followers in the opposite direction; first and second flow passages in the valve housing for connection in series to opposite sides of a function and in fluid flow connection with each other via the function; third and fourth fluid flow passages in the housing for connection in series to a fluid line, accepting fluid flow therethrough in either direction; fluid flow connections controlled by the spool valve and bungee followers between the first fluid flow passage and each of the third and fourth flow passages; and between the second flow passage and each of the third and fourth fluid flow passages; one of the bungee followers and the reciprocating spool valve in one limiting position of the spool valve permitting flow through one of the fluid connections only between the third fluid flow passage and the first fluid flow passage; and between the fourth fluid flow passage and the second fluid flow passage, and the other of the bungee followers and the reciprocating spool valve in the other of its limiting positions permitting flow through one of the fluid flow connections only between the third fluid flow passage and the second fluid flow passage, and between the first fluid flow passage and the fourth fluid flow passage, so that fluid flow in either direction through the third and fourth fluid flow passages is directed in the same direction through the first and second fluid flow passages of the housing.

4,439,985

POWER TRANSMISSION FOR A STIRLING HOT GAS ENGINE

Gerald P. Lamb, 2648 Hartford St., San Diego, Calif. 92110

Filed Sep. 23, 1982, Ser. No. 421,902
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—518 **12 Claims**



1. Improved linear to rotary power transmission for a Stirling type heat engine having at least one common cylinder with a power piston and displacement piston operating therein, said power piston connected to a power piston shaft and said displacement piston connected to a displacement piston shaft, said displacement piston shaft linearly translatable within said power piston shaft with its distal end extending beyond the distal end of said power piston shaft and a common rotary drive shaft with a flywheel connected to one end thereof comprising:

a pair of connecting arms, one connected between said displacement piston shaft and said common drive shaft and the other connected between said power piston shaft and said common drive shaft, said connections to said piston shafts comprise universal joint means and said connections to said common drive shaft comprises a rotatable connection through axial eccentrics fixed in position on said common drive shaft, said axial eccentrics having a selected angular displacement from the longitudinal center line of said common drive shaft whereby said pistons operably translate within said cylinder while maintaining a preselected relative displacement between said pistons.

4,439,986

HYDRAULIC POWER UNIT

Joseph D. Snitgen, 18828 Hillcrest, Birmingham, Mich. 48009

Filed Jan. 23, 1981, Ser. No. 228,156
Int. Cl.³ B60T *13/00*
U.S. Cl. 60—547.1 **10 Claims**

1. An air operated demand only hydraulic power unit for supplying hydraulic fluid under pressure to one or more hydraulic working cylinders, each having a working piston thereof, comprising:

a pneumatic first extensible fluid motor means having a first power transmitting means therein;

a solenoid operated air supply valve actuatable to a first position to place one side of said first power transmitting means in fluid communication with a pressurized source of air and the opposite side thereof in fluid communication with atmosphere, and to a second position to place said one side of said first power transmitting means in fluid communication with atmosphere and said opposite side in fluid communication with a pressurized source of air;

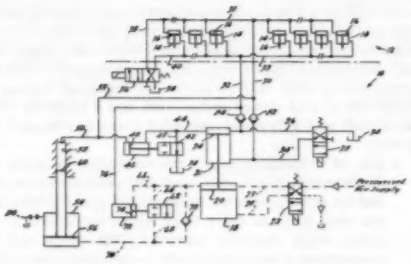
a hydraulic second slave extensible fluid motor means having a second power transmitting means therein,

said second power transmitting means being operatively connected to and powered by said first power transmitting means;

said second extensible fluid motor means being connected via an advance oil conduit and a retract oil conduit to each said working cylinder so that movement of said second power transmitting means in a first direction will cause oil to be pumped out of said second extensible fluid motor means through said advance conduit to advance each said working piston, and movement of said second power transmitting means in the opposite direction will cause oil to flow through said retract conduit to retract each said working piston;

an oil supply valve actuatable by said solenoid operated air supply valve to a first position when said air supply valve is in said first position to place one side of said second power transmitting means in fluid communication with an oil reservoir and to block fluid communication between the opposite side thereof and said reservoir, and to a second position to block fluid communication between said one side of said second power transmitting means and said reservoir;

reset means for insuring full cycling of said second power transmitting means in said second extensible fluid motor, said reset means disposed between said advance oil conduit and said retract oil conduit, comprising a flow control



check valve and a bypass flow control around said check valve, said check valve being closed when oil in said retract oil conduit is at a higher pressure than oil in said advance oil conduit, said bypass flow control being operable to feed oil to said advance oil conduit from said retract oil conduit when said check valve is in a closed position;

an advance intensifier comprising a first oil cylinder having a first piston therein and a second oil cylinder having an intensifying piston therein powered by said first oil cylinder piston, said second oil cylinder being in fluid communication with said advance oil conduit and one end of said first piston being in fluid communication with said retract oil conduit;

a two-position sequencing valve for controlling said intensifier, said sequencing valve being operable in its second position to place the other end of said first piston in fluid communication with said hydraulic second slave extensible fluid motor means and in its first position to block fluid communication between said other end of said first piston and said hydraulic second slave extensible fluid motor means; and

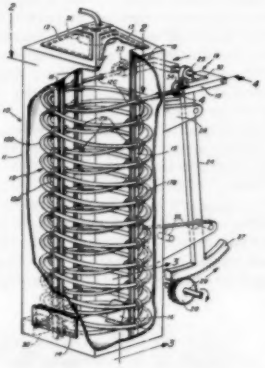
a retract intensifier, comprising hydraulic cylinder means communicating with said retract oil conduit, having piston means and means for coupling the movement of said hydraulic second slave extensible fluid motor means with said piston means in the retract stroke of said hydraulic second slave extensible fluid motor means.

4,439,987

PRIME MOVER OPERATED BY THE EXPANSION AND CONTRACTION OF A TUBULAR METAL MEMBER OF SUBSTANTIAL LENGTH

Merle C. Rideout, Jr., 415 Congress St., Portland, Me. 04101

Filed Sep. 14, 1981, Ser. No. 301,589
Int. Cl.³ F03G *7/02*
U.S. Cl. 60—641.11 **7 Claims**



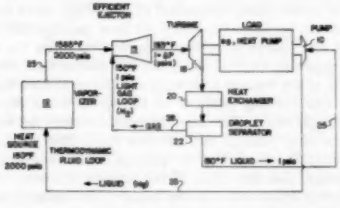
1. A prime mover for operating a mechanism capable of producing energy that may be stored and released at a controlled rate, said prime mover including a tower constructed to be solar heated and cooled at night, a tubular metal member of substantial length and in the form of a vertical coil within the tower, means operable to subject the exterior surfaces of said member to heating and cooling intervals, means to effect the flow of ambient atmosphere through said coil during both intervals, said heating and cooling intervals and the length and wall thickness of said member such that the expansion and contraction of said member produces work strokes having a substantial force but too short for use in operating said mechanism directly, and means connected to at least one end of said member and operable to convert the work strokes into second work strokes of increased length but having a decreased force, the length and force of the second work strokes adequate to operate said mechanism.

4,439,988

RANKINE CYCLE EJECTOR AUGMENTED TURBINE ENGINE

John E. Minardi; Maurice O. Lawson; Hans P. von Ohain, and Ival O. Salyer, all of Dayton, Ohio, assignors to University of Dayton, Dayton, Ohio

Filed Nov. 6, 1980, Ser. No. 204,413
Int. Cl.³ F01K *25/06*
U.S. Cl. 60—649 **13 Claims**



1. The process of extracting energy from a high-temperature high-pressure working fluid, comprising

augmenting flow of the working fluid with a flow of gas from a source separate from the working fluid,

utilizing some of the energy from the working fluid to induce addition and mixture of the gas thereinto and thereby to create a flow of the mixed fluids having a greater mass and lower temperature than the initial flow of working fluid,

supplying the mixed fluids to a turbine for converting the energy in the mixed fluids into mechanical energy, and

separating and recycling at least the augmenting gas from the fluid flow exhausted from the turbine.

4,439,989

INTERNAL COMBUSTION ENGINE PROVIDED WITH A PLURALITY OF POWER UNITS

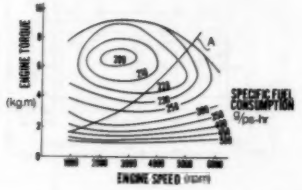
Toru Yamakawa, Hachioji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00362, § 371 Date Jul. 29, 1982, § 102(e) Date Jul. 29, 1982, PCT Pub. No. WO82/01916, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 30, 1981, Ser. No. 403,738

Int. Cl.³ F02D *25/00, 17/02, 35/00;* **F02B** *73/00*

U.S. Cl. 60—718 **3 Claims**



1. An internal combustion engine for a vehicle, which comprises a plurality of independent engine units including a primary engine unit and an auxiliary engine unit, and an output shaft, characterized in that the primary engine is connected to the output shaft and the auxiliary engine unit is connected to the output shaft through a clutch, that a control system is provided with means for detecting phase difference between both engine units and for engaging the clutch at a proper phase difference.

4,439,990

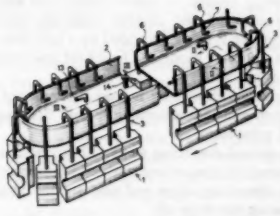
METHOD AND DEVICE FOR COOLING MOLDS

Arnoldus W. Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Jun. 8, 1982, Ser. No. 386,279

Int. Cl.³ F25D *13/06*

U.S. Cl. 62—63 **4 Claims**



1. The method of cooling plastic molds having vertical intake and discharge fluid tubes in communication with a coolant cavity in the mold, arranging the molds for horizontal travel in a closed loop, positioning a static coolant reservoir above the molds and placing the fluid intake tube of each mold in communication with the coolant in the static reservoir, positioning a static coolant collector below the molds and in communication with the mold fluid discharge tubes, and siphoning coolant from the static coolant reservoir through the intake and discharge tubes passing coolant through the molds and discharging it in the static coolant collector.

4,439,991

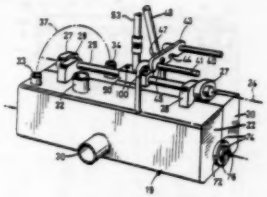
METHOD AND APPARATUS FOR TREATING ELONGATE MATERIALS

Nicholas Muzak, Hamilton, Canada, assignor to Steico Inc., Hamilton, Canada

Filed Jun. 11, 1982, Ser. No. 387,421

Int. Cl.³ F25D *13/06, 17/02;* **F25B** *19/00*

U.S. Cl. 62—63 **13 Claims**



1. A method for treating wire, comprising the steps:

(a) providing a housing defining a chamber having an inlet for the wire and an outlet for the wire, both the inlet and the outlet being larger in are a than the maximum cross-sectional area of the wire,

(b) passing the wire through the chamber from the inlet to the outlet,

(c) within said chamber spraying liquid against the wire, and

(d) using suction means to withdraw air and liquid from said chamber at a rate which results in an air-wiping effect on the wire due to the entry of ambient air through the inlet and outlet of said chamber.

4,439,992

OPEN TOP REFRIGERATED CASE WITH DEFROST AIR INTAKE AND COLLIDING BAND AIR DEFROST

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 226,768, Jan. 21, 1981, Pat. No. 4,337,626, which is a continuation-in-part of Ser. No. 145,859, May 1, 1980, Pat. No. 4,314,457, which is a continuation-in-part of Ser. No. 107,261, Dec. 26, 1979, Pat. No. 4,265,092, Ser. No. 76,669, Sep. 18, 1979, Pat. No. 4,314,453, and Ser. No. 60,459, Jul. 25, 1979, Pat. No. 4,295,340, and a continuation-in-part of Ser. No. 295,542, Aug. 24, 1981, which is a continuation-in-part of Ser. No. 11,804, Feb. 14, 1979, abandoned. This application Jul. 6, 1982, Ser. No. 395,480

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.³ A47F *3/04*

U.S. Cl. 62—82 **24 Claims**

1. A refrigerated display case, comprising:

an open top cabinet containing at least one well type display space;

primary air conduit means in said cabinet extending around said display space, said primary conduit means containing refrigeration coil means;

defrost ambient air intake means in air flow communication with said primary conduit means;

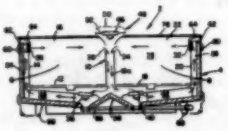
first air opening means and second air opening means formed in said primary conduit means and located on opposite sides of said display space;

main air circulating means for circulating air through said primary conduit means and across the open top of said

display space during refrigeration cycle between said first and second air opening means in the form of an air curtain;

defrost air circulating means located in said ambient air intake means;

defrost control means for energizing said defrost air circulating means at the start of a defrost cycle to move ambient air into said defrost ambient air intake means, a first portion of said ambient air being directed out of said intake means and out of one of said air opening means substantially in the opposite direction to the flow of the air curtain to collide with said air curtain, at least a portion of said air curtain being thereby reversed and caused to flow over the top of and outside the display case, and a further portion of said ambient air being drawn into said primary conduit means by said main air circulating means to flow through said primary conduit means and over said refrigeration coil means and to be discharged through the other of said air openings.



4,439,993

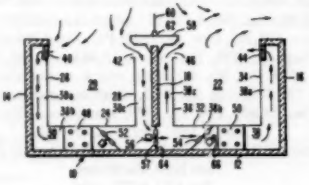
WIDE ISLAND AIR DEFROST CASE UTILIZING AIR TRANSFER CIRCULATING MEANS

George E. Wallace, Levittown, Pa., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Feb. 2, 1983, Ser. No. 463,082

Int. Cl.³ A47F 3/04

U.S. Cl. 62—82 **25 Claims**



20. A method of defrosting a wide island refrigerated display case of the type through which air is circulated during both refrigeration and defrost, said case having side-by-side, upwardly opening product wells separated by a central partition, said wells including primary conduits each having an inlet and an outlet for directing air across the open tops of the wells, evaporators within the conduits, and primary fans in the conduits for circulating air therethrough, comprising the steps of:

a. drawing ambient air into one of the conduits for passage therethrough; and

b. exhausting said air from the other conduit, wherein the steps of drawing ambient air into the case and exhausting the air therefrom comprise drawing the incoming air through both the inlet and the outlet of said one conduit, and exhausting the outgoing air through both the inlet and the outlet of the other conduit.

4,439,994

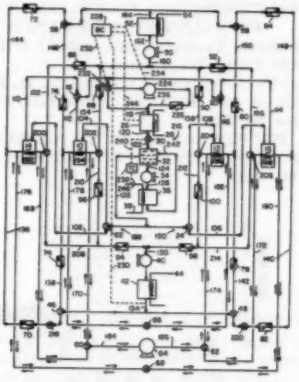
THREE PHASE ABSORPTION SYSTEMS AND METHODS FOR REFRIGERATION AND HEAT PUMP CYCLES

Patrick B. Briley, Lawton, Okla., assignor to Hybrid Energy Systems, Inc., Stillwater, Okla.

Filed Jul. 6, 1982, Ser. No. 395,357

Int. Cl.³ F25B 15/00

U.S. Cl. 62—101 **34 Claims**



26. A method for providing heating and cooling from an absorption system which includes two subsystems each containing at least two absorption-desorption reactors which method comprises the steps of:

desorbing a refrigerant gas from a first absorbing material in a first reactor in said first subsystem at a pressure P, and a temperature T, with the heat to desorb the said refrigerant gas being provided by a primary heat source;

condensing at least some liquid refrigerant out of said desorbed refrigerant gas wherein cooling for said condensing is provided by a primary heat sink;

expanding refrigerant fluid from said condensing step to obtain a lower temperature refrigerant fluid at a lower pressure;

evaporating at least some of said liquid refrigerant after said expanding step;

absorbing the fluid from said evaporating step in a second absorbing material in a first reactor of said second subsystem at a temperature T_2 and a pressure P_2 less than P, with the cooling needed to remove heat from said second absorbing material and thereby maintain pressure P_2 less than pressure P being provided by a heat sink when operating in a cooling mode and by a heat load when operating in a heating mode;

terminating said desorbing in said first reactor of said first subsystem and said absorbing in said first reactor of said second subsystem;

initiating second desorbing steps and second absorbing steps approximately concurrent with said terminating step, said second desorbing steps and said second absorbing steps comprising the steps of:

desorbing at said pressure P and said temperature T a second absorbing material in a second reactor of said first subsystem; and

absorbing at said pressure P_2 and said temperature T_2 in a first absorbing material in a second reactor of said second subsystem;

heating contents of first reactor in said second subsystem at a constant volume from temperature T_2 to a higher tem-

perature T_3 sufficient to increase pressure in said first reactor to pressure P;

cooling contents of first reactor in said first subsystem at constant volume from temperature T to a temperature T_4 sufficient to decrease pressure in said reactor to pressure P_2;

terminating said desorbing in said second reactor of said first subsystem and said absorbing in said second reactor of said second subsystem; and

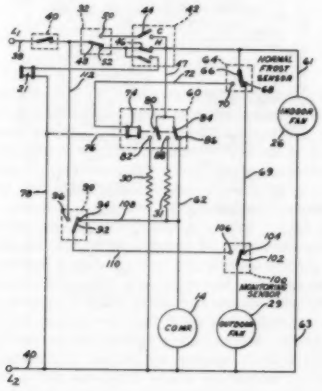
cyclically repeating the foregoing steps.

4,439,995

AIR CONDITIONING HEAT PUMP SYSTEM HAVING AN INITIAL FROST MONITORING CONTROL MEANS

William J. McCarty, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 5, 1982, Ser. No. 365,419
Int. Cl.³ F25D 21/10
U.S. Cl. 62—156 6 Claims



1. In a self-contained air conditioning unit for heating and cooling an enclosure, a refrigerant circuit including an outdoor heat exchanger and an indoor heat exchanger, a compressor, a reversing valve for selectively connecting said compressor to said heat exchangers whereby said outdoor heat exchanger functions as an evaporator during operation of said unit in the heating cycle and said indoor heat exchanger functions as an evaporator during operation of said unit in the cooling cycle, fan means for moving enclosure air through said indoor heat exchanger, fan means for moving outdoor ambient air through said outdoor heat exchanger, an air conditioner heating cycle control system, comprising:

an enclosure temperature selecting thermostat having switch means operable for controlling operation of said compressor for maintaining the temperature of said enclosure within a selected temperature range;

a normal frost control means including a sensing element for detecting a layer of frost on said outdoor heat exchanger, means under control of said frost control means including a first switch means operable for energizing said compressor in the heating cycle when the temperature sensed by said sensing element is above a preselected frost accumulation level and for deenergizing said compressor and said outdoor fan means when the temperature sensed by said sensing element is below a preselected frost accumulation level;

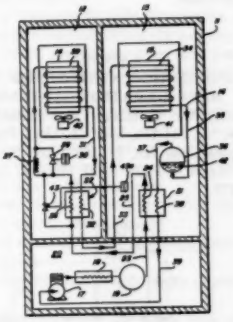
a frost monitoring control means including a sensing element for sensing outdoor temperature and the temperature of said outdoor heat exchanger including means for insuring continuous operation of said outdoor fan when the Δt of the (outdoor air − outdoor heat exchanger temp) is a predetermined amount and said compressor is deenergized through said normal frost control means or cycling through said enclosure temperature selecting thermostat so that outdoor air circulates continuously through said outdoor heat exchanger to remove frost during compressor off period during normal cycling operation of the unit in the heating mode.

4,439,996

BINARY REFRIGERANT SYSTEM WITH EXPANSION VALVE CONTROL

Edwin H. Frohbieter, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 8, 1982, Ser. No. 338,580
Int. Cl.³ F25B 41/00
U.S. Cl. 62—174 11 Claims



1. In a variable capacity refrigerator-freezer including means forming a fresh food storage compartment, means forming a frozen food storage compartment, and a sealed refrigeration system including a fresh food evaporator, a freezer evaporator, a compressor, a condenser, refrigerant expansion means for modulating the capacity of said refrigeration system, a series of refrigerant conduits connecting said evaporators, compressor, expansion means, and condenser into a sealed system, and within said sealed system a refrigerant mixture of two nonazeotropic refrigerants having substantially different boiling points, the improvement comprising:

a first accumulator connected between said condenser and said expansion means to receive the condensate leaving the condenser;

a second refrigerant accumulator connected between said fresh food evaporator and said compressor, said refrigerant expansion means for modulating the capacity of said refrigeration system comprising an air sensing thermostatically controlled expansion valve in said frozen food storage compartment for controlling flow of refrigerant to said freezer evaporator, and a capillary tube connected to said conduits so as to bypass said expansion valve, said capillary tube being sized to provide at least a minimum capacity flow for said system at all times, said capillary tube comprising means for metering the flow of refrigerant so that only superheated refrigerant vapors leave said fresh food evaporator and said second accumulator tends to become free of liquid refrigerant as a result of said expansion valve closing, whereby said system is operating at its lowest capacity since all of the higher boiling point refrigerant in the system is in the active refrigerant stream, whereby the refrigeration system comprises automatically a modulated binary refrigerant system, said condensate leaving the condenser having the same refrigerant composition as the gas from said second accumulator, and as the freezer evaporator continues to flood more of the total refrigerant in said sealed system leaves said first accumulator and is stored in said second accumulator until substantially only the lower boiling point refrigerant is circulating

in said sealed system with a pool of the higher boiling point refrigerant accumulating in said second accumulator, and with the lower boiling point refrigerant at saturation supplying the compressor whereby said system is operating at maximum capacity;

a heat exchanger interposed between said first accumulator and said expansion means; and

means to shift refrigeration effect from the freezer compartment to the fresh food compartment comprising a bypass conduit around a heat-giving portion of said heat exchanger, said conduit having a valve controlled by air temperature in said fresh food storage compartment to shunt refrigerant around said heat exchanger, thereby causing the refrigerant leaving the heat exchanger to become colder before its entry to the fresh food compartment evaporator.

4,439,997

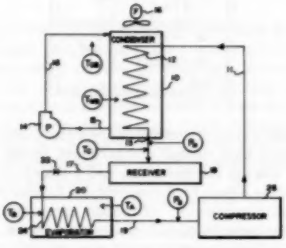
ENERGY MANAGEMENT SYSTEM FOR MULTI STAGE REFRIGERATION SYSTEMS

Robert J. Cantley, 905 Versailles Ct., Maitland, Fla. 32751

Division of Ser. No. 244,161, Mar. 16, 1981, Pat. No. 4,325,223. This application Jan. 11, 1982, Ser. No. 338,673

Int. Cl.³ F25B 7/00; F04B 41/06

U.S. Cl. 62—175 **5 Claims**



1. An energy management system for a two-stage refrigeration system or the like having evaporative condensers, booster compressors, and main compressors, comprising:

first pressure transducer connected in said refrigeration system to produce a first electrical signal representative of the head pressure;

second pressure transducer means connected into said refrigeration system to produce a second electrical signal representative of the intermediate suction pressure;

third pressure transducer means connected in said refrigeration system to produce a third electrical signal proportional to the booster suction;

memory means for storing electrical signals representative of the preselected design value of booster suction pressure; and

calculation and control means connected to said first, second, and third pressure transducers for receiving said first, second, and third electrical signals and to said memory, said calculation and control means for comparing said booster suction pressure signal to said stored design booster suction pressure signal, said calculation and control means controlling loading and unloading of said booster compressor to achieve said design booster suction pressure; and

said calculation and control means calculating an optimum intermediate suction pressure from said first and third electrical signals from said first and third pressure transducers, said calculation and control means controlling said main compressors to achieve said optimum intermediate suction pressure.

4,439,998

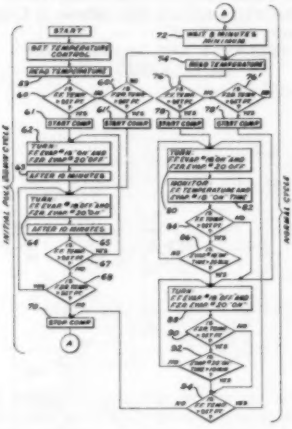
APPARATUS AND METHOD OF CONTROLLING AIR TEMPERATURE OF A TWO-EVAPORATOR REFRIGERATION SYSTEM

Julius B. Horvay, and Luis E. Prada, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 183,863, Sep. 4, 1980, abandoned. This application Apr. 16, 1982, Ser. No. 369,316

Int. Cl.³ F25B 41/00

U.S. Cl. 62—199 **6 Claims**



1. In a refrigerating apparatus including a cabinet containing an above freezing compartment and a below freezing compartment, a refrigeration system including a compressor, a condenser, a first evaporator arranged in said above freezing compartment, a second evaporator arranged in said below freezing compartment, valve means operable for delivering refrigerant to either one of said evaporators, temperature selecting means in each of said compartments for selecting a set temperature in said compartment, a first temperature responsive means in said above freezing compartment, a second temperature responsive means in said below freezing compartment, the combination including a normal operating cycle operable when the temperature of both of said compartments is within a set temperature and an initial pull down cycle operable when the temperature of said fresh food compartment is substantially above said set temperature comprising:

control means for causing said valve means to deliver refrigerant to said first evaporator in preference to said second evaporator when both of said temperature responsive means sense a temperature above a predetermined value;

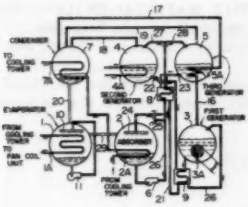
decision means for causing said valve means to terminate the flow of refrigerant to said first evaporator when said above freezing compartment is at said predetermined temperature or after a predetermined amount of time independent of said first temperature responsive means and to cause said second valve means to deliver refrigerant to said second evaporator and for proceeding under said normal operating cycle when the temperature of both of said compartments is below said set temperature.

4,439,999

ABSORPTION TYPE REFRIGERATION SYSTEM

Akio Mori; Shozo Watanabe; Mitsunobu Matsunaga, all of Toyota; Kenzi Machizawa, and Ryohei Minowa, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Toyota Jidosha Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 448,036
Claims priority, application Japan, Dec. 9, 1981, 56-196764
Int. Cl.³ F25B 27/02
U.S. Cl. 62—238.3 6 Claims



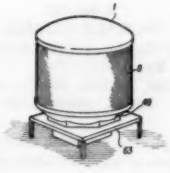
1. A combination of an absorption type refrigeration system and an internal combustion engine, said absorption type refrigeration system including an evaporator for generating cooled water, an absorber in which a gaseous refrigerant is absorbed into a solution to generate a thin solution of a low concentration, at least two generators adapted for heating a solution thereby to generate a gaseous refrigerant, a condenser for condensing the gaseous refrigerant generated in said generators into a liquid refrigerant, a pump for delivering said thin solution generated in said absorber into said generators, and at least one heat exchanger for effecting a heat exchange between the solution flowing into said generators and the solution flowing out of said generators, said internal combustion engine including an exhaust gas passage and an engine cooling water passage, wherein said exhaust gas passage of said engine is connected to a first generator which operates at the highest temperature in said absorption type refrigeration system, while said engine cooling water passage is connected to a heating tube of a second generator which operates at a temperature lower than the operating temperature of said first generator, whereby both of the exhaust gas discharged from said engine and the heated engine cooling water circulated through said engine are simultaneously used as the heat sources of said absorption type refrigeration system.

4,440,000

EVAPORATIVE COOLER

Rockney D. Bacchus; Richard E. Bacchus, and Ronald A. Bacchus, all of 1401 Hawthorne, El Paso, Tex. 79902

Continuation of Ser. No. 107,520, Dec. 27, 1979, abandoned. This application Mar. 4, 1982, Ser. No. 354,607
Int. Cl.³ F28D 5/00
U.S. Cl. 62—310 9 Claims



1. In an evaporative cooler including horizontal, dish-like, generally circular base and cover members; a vertical evaporative pad substantially enclosing, with said cover members, an interior volume of the cooler; air inlet and outlet openings communicating with the interior of the cooler; a blower means, including a drive motor, within the cooler for circulating air through the inlet and outlet openings; and means for continuously supplying water to the upper end of the evaporative pad during cooler operation; the improvement comprising:

a rigid self-supportive, generally cylindrically curved evaporative pad and cover member having air flow openings therethrough, said pad and cover support member extending between said base and cover members, and comprising the sole means for structurally supporting the cover member above the base member; said airflow openings being separated by narrow, elongated rod-like elements;

a flexible elongated, fibrous, saturable evaporative pad wrapped around the outer periphery of said pad and cover support member and in engagement with the pad and the cover support member;

an elongated, continuous flexible foraminous pad retainer having free ends wrapped around the evaporative pad and the pad and cover support member, said free ends being secured under tension by means of a releasable connector means;

said pad and cover support member comprising the sole means for structurally supporting the cover member above the base member, and comprising a one-piece, curved, semi-rigid element formed of an open mesh network of narrow, rod-like elements;

said base member including said air outlet opening which extends downwardly therethrough;

an inwardly and upwardly tapered flange surrounding said outlet opening;

an upstanding rim defining the periphery of said base member;

said flange terminating above the upper edge of said rim;

said blower and blower motor secured to said flange and extending upwardly therefrom;

said base member adapted to retain a layer of water between said rim and said flange;

said blower having an air discharge opening in communication with said air outlet opening and an air intake opening communicating with the interior of the cooler;

said blower comprising a centrifugal blower including a cylindrical, cage-like rotatable impeller having an imperforate central baffle extending radially across the interior of the impeller to divide the blower into two opposed sections.

4,440,001

CHILLERS

Isaih Vardi, Rehovot; Yigal Kimchi, Ramat Gan, and Jonathan Ben-Dror, Hadar Am, all of Israel, assignors to Esbel Residual Energy for Cooling and Heating Ltd., Azor, Israel

Continuation-in-part of Ser. No. 150,044, May 15, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,593
Claims priority, application Israel, May 16, 1979, 57308
Int. Cl.³ F25B 43/04
U.S. Cl. 62—475 1 Claim

1. An absorption type refrigeration system based on lithium bromide solution and water, comprising:

a first vessel housing a condenser and a generator;

a second vessel housing an absorber and an evaporator;

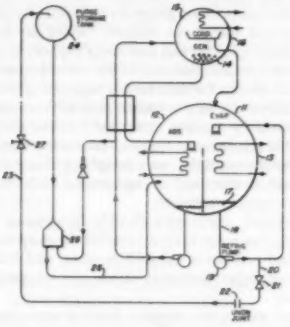
a purge storage tank;

conduit means for interconnecting said first vessel, said second vessel and said purge storage tank;

a refrigeration pump for puming water containing lithium bromide from the bottom of the evaporator to nozzles spraying same into said evaporator, which water gradually becomes contaminated by additional lithium bromide carried over from the absorber; and

an auxiliary system for removing a solution of aqueous lithium bromide from said evaporator when its concentration exceeds a certain predetermined value, said auxiliary system comprising a disconnectable conduit leading from said refrigeration pump and a valve and an union joint for

connecting said disconnectable conduit to said purge storage tank, the solution being fed from said purge storage tank to the absorber after purging non-condensibles from the solution in the purge storage tank, water being



introduced into said evaporator to replace the removed solution of aqueous lithium bromide, said conduit of said auxiliary system being disconnected from said purge storage tank during normal operation of said refrigeration system.

4,440,002

VARIABLE DRAW MECHANISM FOR STRAIGHT BAR KNITTING MACHINES

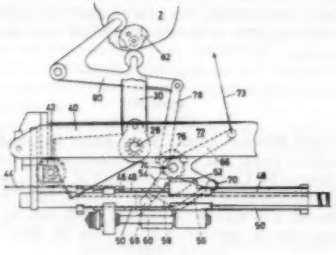
Barry C. Strong, Syston, and Herbert Brain, Wymeswold, both of England, assignors to William Cotton Limited, Leicestershire, England

Filed Aug. 12, 1982, Ser. No. 407,507

Claims priority, application United Kingdom, Aug. 14, 1981, 8124681

Int. Cl.³ D04B *15/52*

U.S. Cl. 66—126 R 7 Claims



1. Straight bar knitting machine having a variable draw mechanism and a slurcock and yarn carrier movable to and fro by the draw mechanism, said draw mechanism including:

a gear arrangement having a differential drivingly connected to the slurcock and the carrier, a draw cam, draw cam follower means, a first input member drivingly connected to the gear arrangement, means for varying the ratio of transmission of the draw cam follower movement to the first input member to thereby vary draw width and transmission ratio control means therefor;

a second input member drivingly connected to the gear arrangement, said differential combining inputs of the first and second input member to differentiate slurcock and yarn carrier movement;

control means for the second input member having a cam mounting, means for moving said mounting conjointly with the first input member, lead control cam means on the mounting for bodily movement therewith, means for moving said lead control cam means individually with respect to said mounting conjointly with operation of said transmission ratio control means and lead control cam follower means drivingly connected to the second input member to retard the carrier and establish a desired carrier lead for a subsequent draw movement at varying draw widths.

4,440,003

APPARATUS FOR WET TREATMENT OF A LENGTH OF TEXTILE MATERIAL IN HANK FORM

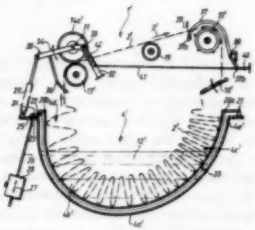
Werner Koch, Wald-Michelbach, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Fed. Rep. of Germany

Filed Aug. 27, 1982, Ser. No. 412,072

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138672

Int. Cl.³ D06B *3/26, 23/02*

U.S. Cl. 68—22 R 13 Claims



1. Apparatus for controlling the rate of movement of a length of textile material through a series of treatment chambers in each of which is monitoring means for monitoring a predetermined change in the quantity of material therein, said apparatus comprising, for each chamber, rotary guide means for introducing said material into such chamber; a pair of rotary squeeze rolls between which said material may be gripped in being withdrawn from such chamber, one of said squeeze rolls being driven; shift means connected to one of said squeeze rolls and responsive to operation of the monitoring means in such chamber to move such squeeze roll toward and away from the other whereby said squeeze rolls are enabled and disabled to grip said material and withdraw it from such chamber; first material support means adjacent said rotary guide means; second material support means adjacent said squeeze rolls, said first and second support means being operable to support said material when said squeeze rolls are so disabled; and means coupling said first and second material support means to one another and to said shift means for moving said support means into and out of material supporting positions in response to movements of said shift means.

4,440,004

WOBBLE WASHER

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 31, 1981, Ser. No. 288,958

Int. Cl.³ D06F *23/04*

U.S. Cl. 68—23 R 9 Claims

1. A washing appliance for fabric articles of the type utilizing a wobbling action to wash the fabric articles, said washing appliance comprising:

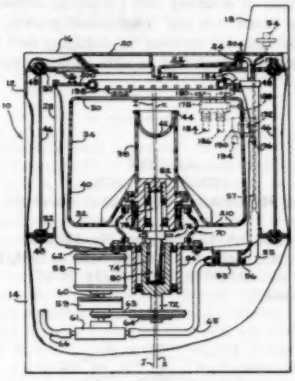
a generally upright basket for receiving washing liquid and a fabric article load to be washed in the liquid, said basket having a longitudinal central axis;

mounting means connected to said basket for movably supporting and selectively driving said basket; said mounting

means including input drive shaft means, the longitudinal axis of said input drive shaft means defining a substantially vertical reference axis for said mounting means;

driving means for selectively rotating said input drive shaft means in a first direction to provide a wash periods of operation and a second direction to provide a spin period of operation;

said mounting means being constructed and arranged to cant the central axis of said basket relative to the reference axis



when said input shaft is rotated in its first direction and to move the central axis to substantially vertically coalign the central axis of said basket and the reference axis thereby eliminating said cant when said input shaft rotates in its second direction whereby said basket is canted relative to the vertical during wash periods to provide wobbling motion of said basket and substantially vertically aligned during spin periods to permit said basket to rotate on center during spin.

4,440,005

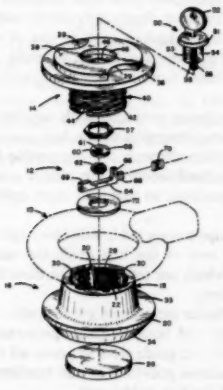
TRAILER HITCH RING LOCK

Marshall Bulle, R.R. 1, P.O. Box 98, Farmington, Minn. 55024

Filed Jun. 8, 1982, Ser. No. 386,243

Int. Cl.³ B60R *25/00*; E05B *27/36*

U.S. Cl. 70—14 **7 Claims**



1. For use with a trailer type vehicle having a generally toroidal shaped coupling hook locking apparatus for inhibiting the unauthorized use of said trailer comprising

(a) a first plate having an aperture therethrough and a tubular cylinder projecting from a first side surface thereof, said tubular cylinder being threaded over a predetermined portion thereof and having a pair of opposing open slots formed through the side walls thereof extending a predetermined distance from the end of said cylinder opposite said plate towards said plate;

(b) a generally elongated latch member slideably mounted within said slots;

(c) a key operated lock assembly secured in said aperture and having a cam member affixed thereto for rotation when a key is inserted in said lock and turned, said cam member cooperating with said latch member for extending at least a portion of said latch member out of one of said slots of said cylinder; and

(d) a second plate having a tubular cylinder projecting from a first side, said cylinder having internal threads along a portion thereof of the proper size and shape that they may be engaged with the threads of said threaded tubular cylinder projecting from said first plate, said tubular cylinder projecting from said second plate having at least one longitudinal groove formed within said cylinder, said groove having a depth greater than said threads therein, the arrangement being such that when the key operated lock is in a first condition, said threaded portion of said cylinder projecting from said first plate may be engaged with the threaded portion of said cylinder projecting from said second plate, by rotating said first plate relative to said second plate, but when said key operated lock is in a second condition, said latch will extend outward from said cylinder of said first plate through one of said slots in said cylinder, and into said longitudinal groove formed in the interior wall of said cylinder projecting from said second plate to prevent relative rotation of said first and second plates.

4,440,006

ANTITHEFT CENTRAL LOCK SYSTEM FOR A MOTOR VEHICLE

Frank Kleefeldt, Heiligenhaus, Fed. Rep. of Germany, assignor to Kiekert GmbH & Co. Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 132,977, Mar. 24, 1980, Pat. No. 4,342,209, and a continuation-in-part of Ser. No. 132,978, Mar. 24, 1980, Pat. No. 4,364,249. This application Aug. 14, 1981, Ser. No. 292,792

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911680; Mar. 24, 1979, 2911681; Aug. 16, 1980, 3031066

The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.

Int. Cl.³ E05B *53/00*

U.S. Cl. 70—264 **10 Claims**

1. A central door-lock system comprising:

a plurality of door latches each including

a detent displaceable between an open position securing the respective door to the respective doorpost and a closed position permitting the respective door to separate from the respective doorpost,

a manual door-opening handle,

mechanism including a primary latch member connected to said handle and connectable to said detent and movable between a lock position preventing said handle from displacing said detent between said open and closed positions and an unlock position permitting said handle to displace said detent between said open and closed positions, and

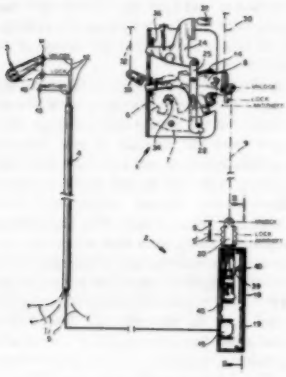
means connected to said mechanism and including a secondary latch member displaceable between a lock position urging said primary latch member into the respective lock position while permitting said primary latch member to move into the respective unlock position, an unlock position permitting said primary latch member to move freely between the respective lock and unlock

positions, and an antitheft position positively holding said primary member in the respective lock position;

respective servoactuators for said latches each including

an operator linearly displaceable between lock, unlock, and antitheft positions,

an actuator element entrainable by the respective operator, connected to the respective secondary latch member, and jointly displaceable therewith between the respective positions, and



means including a reversible electric servomotor and a rack-and-pinion gear train connected between said motor and the respective operator for displacing the respective secondary latch member via the respective actuator element and operator between the respective lock, unlock, and antitheft positions; and

means including a central switch connected to said servomotors for operating same jointly and thereby jointly displacing said secondary latch members between the respective positions.

4,440,007

CONTROL DEVICE FOR CYLINDER LOCKS

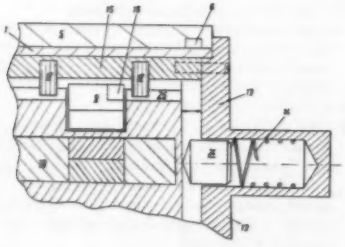
Kurt Prunbauer, Herzogenburg, Austria, assignor to EVVA-Werk Specialerzeugung von Zylinder-und-Sicherheitsschlössern GmbH & Co. KG, Vienna, Austria

Division of Ser. No. 12,895, Feb. 16, 1979. This application Mar. 2, 1981, Ser. No. 239,488

Claims priority, application Austria, Feb. 20, 1978, 1222/78

Int. Cl.³ E05B *9/04, 47/00*

U.S. Cl. 70—276 **1 Claim**



1. A control device, particularly for use in a magnetic cylinder lock, comprising, a housing defining a cylindrical passage, a cylindrical plug disposed in said passage for a rotational and axial movement relative to said housing; and means arranged between said plug and said housing for blocking the rotational movement in one axial position of said plug and for unblocking the rotational movement in another axial position thereof, a rotary sleeve disposed between said plug and said housing, a rear cover plate closing the rear end of said sleeve, a front cover plate closing but for a keyhole therethrough the front end of said sleeve, said plug having at least one longitudinal groove and a plurality of rotary members each supported for rotation about an axis transverse to said longitudinal groove; arresting beams extending in longitudinal direction between said plug and said sleeve and being secured to said rear cover plate, a plurality of arresting pins projecting inwardly from said arresting beams into said longitudinal groove, and said rotary members having recesses for engaging said arresting pins when said plug is in said another axial position in said passage.

4,440,008

TUMBLER LOCK

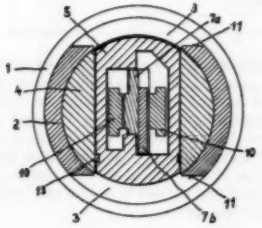
Edmond Uher, Hasenlohweg 16, CH-6315 Oberägeri, Switzerland

Filed Feb. 17, 1982, Ser. No. 349,667

Claims priority, application Austria, Mar. 3, 1981, 14979/81

Int. Cl.³ E05B *15/08, 15/14, 29/06*

U.S. Cl. 70—364 R **8 Claims**



1. A tumbler lock comprising:

an outer cylinder having two longitudinal recesses staggered by 180°,

an inner cylinder having guide slots and mounted in said outer cylinder,

at least two springless plate-type tumblers associated with said inner cylinder, freely movable in said guide slots and engaging, in the locked state, in one of said longitudinal recesses of said outer cylinder, whereby said inner cylinder is prevented from rotating relative to said outer cylinder,

said tumblers being provided with windows for a key and which, during insertion of the key, move in both directions of motion through the key profile from the area of said longitudinal recess to the area of said inner cylinder, the open position, so that said inner cylinder can rotate, and

protective strips connected to said inner cylinder, and covering in the area of the key guide the side flanks of said windows which are parallel to the direction of motion of said tumblers,

said inner cylinder including a guide profile into which, after insertion of said tumblers, said protective strips can be pushed into said guide slots to cover all the side of flanks of said windows provided in said tumblers and located in the area of the key guide, and

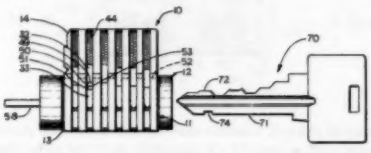
said protective strips, in conjunction with a matched window size serving as stops for said tumblers in the locked state, so that the plunging depths of said individual tumblers into said longitudinal recess on said outer cylinder are determined.

4,440,009

REKEYABLE LOCK METHOD AND APPARATUS

Jerry R. Smith, Littleton, Colo., assignor to Innovative Research Corporation, Littleton, Colo.

Filed Dec. 7, 1981, Ser. No. 327,787
Int. Cl.³ E05B 25/00
U.S. Cl. 70—385 8 Claims



1. In rekeyable lock apparatus, including a lock cylinder housing with a cylindrical bore extending longitudinally therethrough and an elongated top pin chamber in said housing perpendicular to and extending radially outward from said cylindrical bore, a cylindrical core positioned rotatably in said bore, said core having a longitudinal keyway therein for receiving a key bit and a bottom pin chamber extending radially inward from the peripheral surface thereof into said keyway, said bottom pin chamber being adapted to axially align with said top pin chamber when said core is positioned in said cylindrical bore in such a manner that said top and bottom pin chambers form a common pin chamber, a top tumbler pin slideably positioned in said top pin chamber and a bottom tumber pin slideably positioned in said bottom pin chamber, said core being rotatable when the interface between said top and bottom pins is aligned with the shear plane between the core and the cylinder housing and not being rotatable when a pin is positioned through said shear plane, the improvement comprising:

spacer means positioned in said bottom pin chamber between said top pin and said bottom pin for providing an additional interface between said top and bottom pins adapted for alignment with the shear plane between said core and said cylinder housing, one interface being on the top of said spacer means and a second interface being on the bottom of said spacer means;

removal means for removing said spacer means from said pin chamber and ejecting it out of said lock apparatus; and

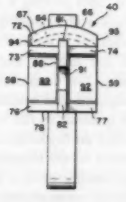
insertion means for inserting said spacer means into said pin chamber.

4,440,010

LOCK AND KEY DEVICE

Francois Guiraud, Chambourcy, France, assignor to Fichet-Bauche, Velizy, France

Continuation of Ser. No. 285,778, Jul. 22, 1981, abandoned, which is a continuation of Ser. No. 974,557, Dec. 29, 1978, Pat. No. 4,296,618. This application Sep. 29, 1982, Ser. No. 428,292
Claims priority, application France, Dec. 30, 1977, 77 39747
Int. Cl.³ E05B 19/06
U.S. Cl. 70—409 4 Claims



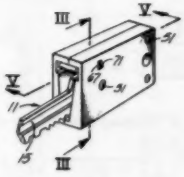
1. A key comprising: an operational means for insertion into a lock having two pairs of slotted wings, a median longitudinal rib extending along the operational means of the key between the wings of one of said pairs and adapted to distinguish this pair of wings from the other pair, and a transversal rib projecting from a rear end of the longitudinal rib.

4,440,011

LOCK POSITION INDICATOR

Martin Klein, 18542 Cylmer St., Northridge, Calif. 91326

Filed Jun. 4, 1981, Ser. No. 270,264
Int. Cl.³ A47G 29/10; E05B 41/00
U.S. Cl. 70—438 15 Claims



1. A device for indicating whether the user of a key left a lock in its locked or unlocked condition comprising:

a key having

a shank and

a handle, the handle having

a first edge;

a second edge; and

a pair of faces between the first and second edges;

a key-holding compartment extending inwardly from one edge of a housing and having

a first wall which is relatively narrow for pivotably seating the first edge of the key handle,

a second wall which is relatively wide and distal from the first edge within the housing,

a pair of side walls interconnecting the first and second walls, the faces of the key handle being selectively locatable adjacent the side walls;

means for positioning the key in the compartment such that the shank extends out of the housing and the key may be pivoted about an axis extending parallel to and along its first edge; and

means for releasably holding the key in the pivoted position extremities thereof such that one of the faces of the key handle is in facial abutment with a side wall at times when a lock is not being actuated by the key.

4,440,012

ROLLING STAND WITH NONCYLINDRICAL ROLLS

Hugo Feldmann, Alsdorf; Friedrich Hollmann, Grevenbroich; Gerd Beisemann, Düsseldorf, and Horst Gärtner, Neuss, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Düsseldorf, Fed. Rep. of Germany

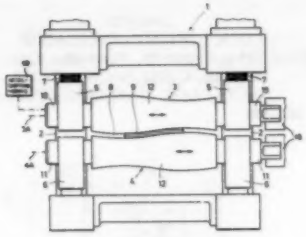
Filed Oct. 14, 1981, Ser. No. 311,449
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038865
Int. Cl.³ B21B 27/02, 31/18
U.S. Cl. 72—201 10 Claims

1. A rolling stand comprising:

a housing defining a pair of parallel and spaced axes defining a plane;

respective rolls having roll ends journaled in said housing at said axes and roll bodies axially symmetrical about the respective axes and having centered on the respective axes complementary roll-body surfaces of noncylindrical shape and each formed by rotation of a continuously curved generatrix about the respective axis, one of said rolls being displaceable axially relative to the other roll from an end position to another position, said surfaces forming at said plane only in said other position a uniform nip and at said plane in said end position a nonuniform nip; and

means for displacing one of said rolls axially relative to the other of said rolls between said end position and said other



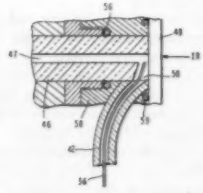
position and for retaining said rolls in either of these positions.

4,440,013

GAS CHROMATOGRAPH, FOURIER TRANSFORM, INFRARED SPECTROSCOPY SYSTEM

Gary E. Adams, Danbury, Conn., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 3, 1982, Ser. No. 354,555
Int. Cl.³ G01N *21/01, 31/08*
U.S. Cl. 73—23.1 **12 Claims**



1. In a GC-IR system for analyzing the constituents of a sample, which system comprises a gas chromatograph including an injector and an oven, and an IR spectrometer for irradiating said constituents, with IR energy, the combination comprising:

a light pipe having an elongated bore coated to direct IR energy from said spectrometer along said bore and through any constituents therein,

and a high-resolution capillary narrow-bore GC column for separating said sample into constituents, said column being at least substantially disposed in said oven and having one end connected to said injector and another end disposed at one end of said bore for discharging effluent from said column directly into said bore into the path of said IR energy, whereby constituents are continuously separated by said column up to the point of discharge whereupon such constituents are immediately irradiated with said IR energy.

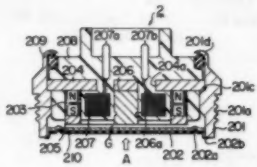
4,440,014

KNOCKING DETECTION DEVICE

Tadashi Hattori, Okazaki; Tadashi Ozaki, Gamagori; Yoshinori Ootsuka; Kazuhiko Miura, both of Okazaki; Masanori Hanaoka, and Yukihide Hashiguchi, both of Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 13, 1982, Ser. No. 368,090
Int. Cl.³ G01L *23/22*
U.S. Cl. 73—35 **4 Claims**

1. A knocking detection device for an internal combustion engine, comprising a diaphragm having one surface adapted to be faced to the engine cooling water and being operative to vibrate in response to pulsation of the pressure of said engine cooling water caused by an engine knocking, and means responsive to the vibration of said diaphragm to produce an



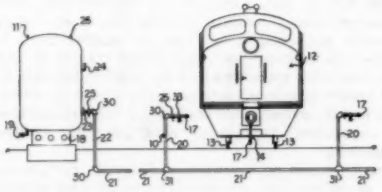
electrical output, wherein said one surface of said diaphragm is coated with a layer of a hydrophilic material to be disposed in direct contact with said engine cooling water.

4,440,015

LOCOMOTIVE AIR BRAKE SYSTEM TESTING DEVICE

Dallas D. Hann, 818 Princeton St., Elkhart, Ind. 46514

Filed Dec. 2, 1981, Ser. No. 326,595
Int. Cl.³ G01M *3/02*
U.S. Cl. 73—39 **10 Claims**



1. An air brake testing device for a locomotive air brake system, the air brake system having a compressed air source, a conduit connectable to rail cars for the ingress and egress of compressed air and a brake valve which is communicatively connected to both the compressed air source and to the ingress and egress conduit of the air brake system, said testing device being primarily for testing the functionality of the brake valve of the brake system, said device comprising:

a. a storage reservoir essentially for holding compressed air and having a volume which is generally equal to a volume of a braking system for a predetermined number of rail cars, said storage reservoir additionally having a pressure gauge, an air pressure safety valve and a bleeder valve, and,

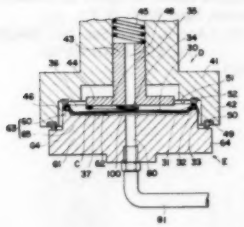
b. a trackside stand having a conduit with opposing ends, one said end being communicatively connected to said storage reservoir and said opposite end having connecting means and being communicatively connectable to the ingress and egress conduit of the locomotive air brake system, said stand further having a flexible testing conduit with connecting means at opposing ends to communicatively attach said flexible conduit between said trackside stand conduit and the ingress and egress conduit of a locomotive, whereby, the communicative connection of said connecting means of said trackside stand conduit and said flexible testing conduit to the ingress and egress conduit of the locomotive air brake system permits the operability and functionality of the locomotive air brake system to be tested by said testing device at said trackside stand by causing the flow of compressed air of the locomotive air brake system to and from said storage reservoir without the requirement of having to actually communicate the locomotive air brake system to a number of rail cars of a predetermined number.

4,440,016

METHOD FOR HIGH SPEED LEAK TEST FOR METALLIC COVER WITH A PULL TAB

Takeshi Konagaya, Yaizu, and Yukinao Yagi, Fujieda, both of Japan, assignors to Daiwa Can Company, Limited, Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,664
Claims priority, application Japan, Oct. 12, 1981, 56-162509
Int. Cl.³ G01M 3/04
U.S. Cl. 73—40 3 Claims



1. A method for performing a high speed leak test for a metallic cover with a pull tab characterized by holding a metallic cover having a central plate portion, a countersink portion, a flange portion and a curled portion which are arranged from the center to the periphery in said order, where an opening-defining score line is coined in said central plate portion and a pull tab is fixed to the upper surface side of said central plate portion, between facing upper and lower parts which define one closed chamber cooperatively, with a very small gap between the lower surface of the central plate portion, the countersink portion and the flange portion of said metallic cover and said lower part dividing said closed chamber into an upper closed portion in which said pull tab is present and a lower closed portion in which said tab is absent making said metallic cover the boundary; comprising the steps of:

injecting pressurized air into said upper closed portion; and

detecting the change in the air pressure within said lower closed portion so as to determine whether the metallic cover has a leak;

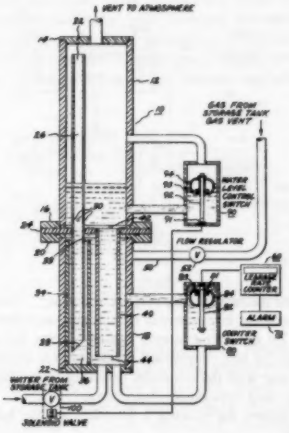
wherein said metallic cover is held between an elastic material attached to said upper part and contacting with the upper surface of the flange portion of the metallic cover and another elastic material attached to said lower part and contacting with the lower surface of the periphery of the central plate portion of the metallic cover to define the upper and the lower closed portions and, said lower closed portion is divided into a closed zone facing the central plate portion of the metallic cover and another closed zone facing the peripheral portion of the metallic cover wherein, in said closed zone facing the central plate portion, the change in the air pressure is detected within the very small gap between the lower surface of said central plate portion and said lower part and within a passage which communicates with said very small gap and leads to a detector, while, in the closed zone facing said peripheral portion, the change in the air pressure is detected within the very small gap between the lower surface of the peripheral portion of the cover comprising said countersink portion, flange portion and curled portion and said lower part and within a passage which communicates with said very small gap and leads to a detector.

4,440,017

HYDROGEN LEAK MONITOR FOR A TURBINE-GENERATOR

Sterling C. Barton, and Joseph E. Pitoniak, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,805
Int. Cl.³ G01M 3/30
U.S. Cl. 73—40.5 R 9 Claims



1. In a dynamoelectric machine, a device for monitoring the leakage of cooling gas into the stator water cooling system, wherein said cooling gas accumulates in a water storage tank of said system, said device comprising: an upper chamber having opposed upper and lower ends;

a lower chamber having opposed upper and lower ends;

the lower end of the upper chamber being affixed to the upper end of the lower chamber and sealed thereto;

a first tubular member having opposed open ends, disposed in the lower chamber and extending upwardly through said seal between said upper and lower chambers and into said upper chamber;

a second tubular member disposed in said lower chamber and having a greater diameter than said first tubular member, one end thereof being affixed to the lower end of said lower chamber and the other end being open to the lower chamber, said second tubular member being spaced from and encompassing a substantial portion of said first tubular member in said lower chamber;

a third tubular member having opposed open ends, the upward open end disposed in the lower chamber and extending upwardly therefrom through said seal and opening into said upper chamber;

the lower end of said third tubular member being open and disposed closer to the lower end of said lower chamber than the lower end of said first tubular member;

the upper end of said first tubular member being disposed further from the lower end of the upper chamber than the upper end of said third tubular member;

a water level control means connected to the upper chamber for maintaining, under normal operating conditions, a volume of water sufficient to cover the upper end of said third tubular member and insufficient to cover the open end of said first tubular member; and

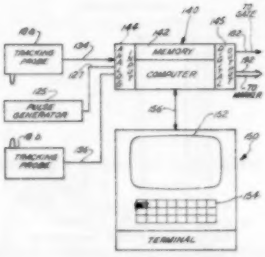
means for introducing the accumulated cooling gas from said storage tank into the lower chamber near the upper end thereof; and

means for venting the gas from the upper chamber.

4,440,018
TIRE SIDEWALL DEFORMATION DETECTION TECHNIQUES

William C. Christie, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 18, 1982, Ser. No. 339,990
Int. Cl.³ G01M 17/02
U.S. Cl. 73—146 28 Claims



1. In a tire manufacturing system including means for assembling and curing components of the tire and for testing the cured tire by detecting lateral runout values for at least one sidewall of the tire, improved apparatus for determining the degree of side wall deformation resulting from the assembling and curing, said apparatus comprising:

storage means for storing a plurality of the lateral runout values;

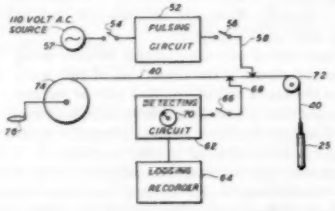
processing means for segregating the lateral runout values into a plurality of groups, each group representing a portion of the sidewall, for calculating a reference value for each group based on at least a portion of the runout values within the group, for comparing the reference values to at least one of the lateral runout values in the group in order to generate a group deformation value indicative of the degree of deformation in the portion of the sidewall represented by the group, and for generating a deformation flag signal if any of the group deformation values generated for the various groups have a predetermined relationship with respect to a predetermined limit; and

means for indicating the condition of the tire in response to the deformation flag signal.

4,440,019
FREE POINT INDICATOR

W. Ray Marshall, 12702 Crow Valley St., Houston, Tex. 77099

Filed May 28, 1982, Ser. No. 383,178
Int. Cl.³ E21B 47/00
U.S. Cl. 73—151 10 Claims



1. A free point indicator for a tubular well string, said indictor comprising a running tool, surface marking apparatus and detection apparatus, and connecting means for both running the tool downhole and selectively and alternately connecting it electrically with the surface apparatuses,

said running tool being adapted for running inside the tubular well string and including a sensitive coil,

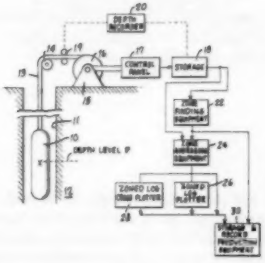
said marking apparatus including an electrical capacitor and switching means for connecting the capacitor to discharge its stored energy through the conecting means to pulse said coil, whereby a magnetic spot is induced at a known depth on the inner wall of the tubular string, and

said detection apparatus including sensitive meter means to detect an induced voltage when said coil moves through the field of said magnetic spot.

4,440,020
WELL LOG DEPTH ZONING

Yves L. Boutemy, Houston, Tex., and Henry N. Edmundson, West Reddington, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 1, 1982, Ser. No. 364,201
Int. Cl.³ E21B 49/00
U.S. Cl. 73—152 25 Claims



1. A well logging method comprising:

generating a number of well logs for a common subsurface depth interval;

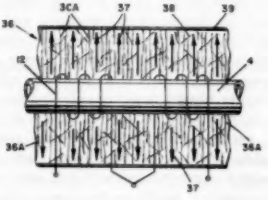
selecting mutually depth-matched portions of the logs and processing them to find subsurface depth zones within each of which the logs have a respective selected mutual consistency; and

producing a tangible record of selected parameters of said zones.

4,440,021
MASS FLOW METER WITH REDUCED ATTITUDE SENSITIVITY

John W. Abouchar, 18881 Patrician Dr., Villa Park, Calif. 92667, and Michael J. Doyle, 2705 Calle Loma Roja, Riverside, Calif. 92805

Filed Jul. 29, 1980, Ser. No. 173,282
Int. Cl.³ G01F 1/68
U.S. Cl. 73—204 12 Claims



1. A mass flow measuring system for accurately measuring the flow rate of a fluid through a tube comprising,

a plurality of self-heating sensing elements positioned along the flow path of said fluid,

means for detecting a temperature differential between said sensing elements, and

a fibrous material encasing said sensor elements wherein said fibrous material includes a substantial number of fibers arranged therein so as to be perpendicular to the axis of the sensing elements in order to conduct heat from said sensing elements in a laminar flow arrangement and to prevent heat flow from being returned to said sensing elements through said fibrous material.

4,440,022

LIQUID-LEVEL DETECTION

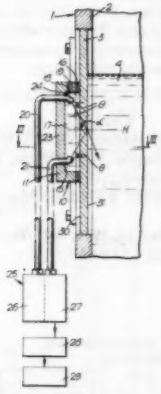
Ronald A. Mason, Bitterne, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Sep. 16, 1982, Ser. No. 419,103

Claims priority, application United Kingdom, Oct. 14, 1981, 8131009

Int. Cl.³ G01F *23/08*

U.S. Cl. 73—293 **8 Claims**



1. A liquid reservoir of the kind having a wall, a window of transparent material mounted in said wall, and a liquid-level detector mounted on said reservoir, the improvement wherein the detector comprises: a mounting assembly shaped to define a cavity facing said window; means sealing said mounting assembly with said window; a transparent liquid or gel in said cavity, said liquid or gel having a refractive index substantially the same as that of said window; transmitting means for transmitting a beam of light through said cavity towards said window at an angle greater than the critical angle of said transparent material with air and less than the critical angle of said transparent material with the liquid in said reservoir, such that said beam of light is refracted into said reservoir when the liquid in the reservoir covers the location at which said beam is incident on the internal face of said window, and is reflected by said internal face when said location is uncovered by the liquid in said reservoir; and receiving means for receiving said beam of light when it is reflected from the internal face of said window, said receiving means providing an output which changes as the level of liquid in said reservoir moves over said location.

4,440,023

CHAIN MOTION MEASURING DEVICE

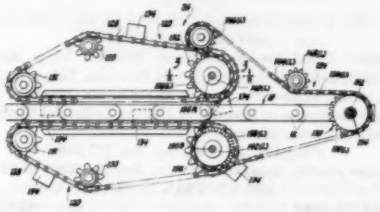
Ulric Landenberger, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 358,345, Mar. 15, 1982, Pat. No. 4,407,162. This application Nov. 12, 1982, Ser. No. 440,818

Int. Cl.³ G01P *3/00*

U.S. Cl. 73—490 **2 Claims**

1. A chain motion measuring device for maintaining precise measurement of the motion of a chain formed of interconnected links when the chain is temporarily reversed and then resumes travel in a forward direction, said device comprising a pair of closed-loop forward-reverse primary drive means adapted to be engaged in staggered fashion and driven by the chain links whereby one of said primary drive means is always fully engaged and driven by the chain and in a direction dependent on that of the chain, closed-loop forward secondary drive means, separate forward overrunning drive means for separately drivingly connecting each of said primary drive means to said forward secondary drive means only when the chain is traveling forward whereby said forward secondary drive means is driven in a forward measuring direction without interruption by one of said foward overrunning drive means overrunning the other, closed-loop reverse secondary drive



means, separate reverse overrunning drive means for separately drivingly connecting each of said primary drive means to said reverse secondary drive means only when the chain is traveling in reverse whereby said reverse secondary drive means is driVen in a reverse measuring direction without interruption by one of said reverse overrunning drive means overrunning the other, and differential drive means for drivingly connecting said forward secondary drive means and said reverse secondary drive means to said measuring means without lost motion whereby said measuring means is caused to give a true reading of actual chain motion in both the forward and reverse directions by the drive of said forward secondary drive means while said reverse secondary drive means remains stationary and vice versa respectively.

4,440,024

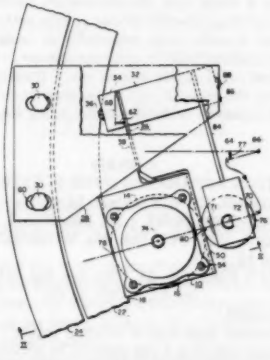
TACHOGENERATOR

William R. Caputo, Wyckoff, and Jitendra K. Trivedi, West Milford, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 26, 1982, Ser. No. 411,791

Int. Cl.³ G01P *1/04, 3/24*

U.S. Cl. 73—529 **7 Claims**



1. In a tachogenerator having a bearing mounted drive shaft,

and a friction drive wheel on the drive shaft driven by a movable surface, the improvement comprising:

means compliantly and frictionlessly mounting the tachogenerator,

at least one pressure roller means, said pressure roller means including a pressure roller in tangential, rolling contact with the friction wheel,

and means biasing said at least one pressure roller against the friction wheel, and the friction wheel against the movable drive surface, to provide the desired friction wheel contact pressure against the movable surface without excessively loading the shaft and bearings of the tachogenerator.

4,440,025

ARC SCAN TRANSDUCER ARRAY HAVING A DIVERGING LENS

Yoshihiro Hayakawa, Sagamihara; Tsutomu Yano; Ryobun Tachita, both of Kawasaki; Hiroshi Fukukita, Tokyo; Kazuyoshi Irioka, Sagamihara, and Akira Fukumoto, Machida, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jun. 26, 1981, Ser. No. 277,816

Claims priority, application Japan, Jun. 27, 1980, 55-88129

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—642 14 Claims

1. An ultrasonic transducer array for transmitting a diverging acoustic beam, comprising:

a plurality of successively arranged, elongated piezoelectric transducers for generating an acoustic beam from different locations of said array;

means for supporting said transducers on a generally convex surface so that said beam diverges from a first point located behing the array; and

an acoustic diverging lens having a first curved surface that is complementary to said convex surface and a second, opposite surface that is generally flat and adapted to contact a body, said complementary curved surface of said lens being attached to said convex surface for diverging said acoustic beam outwardly to cause the acoustic energy transmitted from said transducers to emanate from a second point closer to said array than said first point enabling the array to scan a shallower region of the body than is achieved without said diverging lens.

4,440,026

VIBRATION APPARATUS WITH FLEXURE MEANS

David V. Kimball, 132 W. Chestnut, Monrovia, Calif. 91016

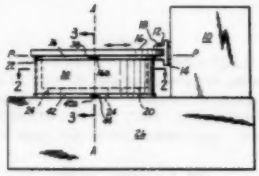
PCT No. PCT/US82/00349, § 371 Date May 4, 1982, § 102(e) Date May 4, 1982, PCT Pub. No. WO83/03370, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 23, 1982, Ser. No. 422,972

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—663 16 Claims

1. In vibration apparatus in which a shaker is coupled to a rigid slip plate carrying a test piece to be universally movable in a single plane and drives said slip plate in axially predetermined sliding engagement with a slip plate support block, flexure means blocking pivoting movement of said slip plate about its center axis normal to said plane, said flexure means being longitudinally bendable responsive to slip plate movement while blocking said pivoting movement, to permit said predetermined axial movement.



16. Method for effecting vibration testing of a test piece carried on a rigid slip plate, which includes vibrating said slip plate in a predetermined axial direction while constraining said slip plate for linear movement only by securement to a longitudinally bendable, torsionally stiff flexure.

4,440,027

VELOCITY AND MASS AIR FLOW SENSOR

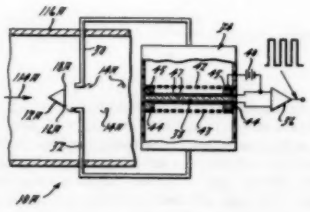
Louis R. Focht, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/00733, § 371 Date May 26, 1982, § 102(e) Date May 26, 1982

PCT Filed May 26, 1982, Ser. No. 403,748

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.24 2 Claims



1. A device for measuring the velocity of a fluid comprising:

a vortex generating means positioned in a fluid stream so that a first stream and a second stream of vortices are formed in the wake of said generating means;

a first pitot tube pressure sensor means positioned in said first stream of vortices for sensing and conducting a pressure variation caused by the passage of the vortices;

a second pitot tube pressure sensor means positioned in said second stream of vortices for sensing and conducting a pressure variation caused by the passage of the vortices;

said first pressure sensor means and said second pressure sensor means being positioned substantially the same distance downstream of said vortex generating means;

a differential processing means coupled to said first and second pressure sensor means for inverting the input from one of said first and second pressure sensor means thereby increasing pressure variations between the two and cancelling out pressure variations common to said first and second pressure sensor means;

said differential processing means including a differential microphone having a diaphragm, a first chamber on one side of said diaphragm being coupled to said first pressure sensor means, and a second chamber on the other side of said diaphragm being coupled to said second pressure sensor means;

a threshold detector with an inverting and a non-inverting

input coupled to the output of said differential microphone;

said differential microphone being formed of a generally planar piezoelectric material, each side having a conducting means, one conducting means being connected to said inverting input and the other conducting means being connected to said non-inverting input of said threshold detector; and

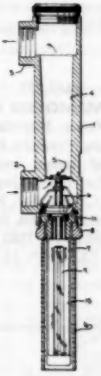
a polarizing screen adjacennt to and insulated from said diaphragm and a polarizing voltage being applied between said polarizing screen and the adjacent one of said conducting means thereby bowing said diaphragm and producing a bias voltage.

4,440,028

PROTECTIVE SHIELD FOR FLOW METER SIGHT GLASS

Ralph W. Ramlow, East Troy, Wis., assignor to Waukee Engineering Company Inc., Milwaukee, Wis.

Filed Mar. 1, 1982, Ser. No. 353,180
Int. Cl.³ G01F 1/22
U.S. Cl. 73—861.55 **7 Claims**



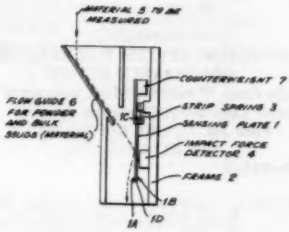
1. A flow meter, comprising a body having a fluid inlet and fluid outlet and having a passage connecting said inlet and outlet, a float assembly disposed within said passage and adapted to move within the passage in accordance with the rate of flow of fluid therethrough, a guard connected to the body and having an elongated recess, a transparent sight glass disposed within the recess, a rod connected to the float assembly and extending within the sight glass, an indicator connected to the rod, a scale mounted adjacent said recess, movement of the indicator within the sight glass indicating the rate of flow on the scale, a tubular shield disposed around the guard and having a transparent portion disposed in alignment with said sight glass and said scale, an abutment on said guard, and spring clip means mounted on the shield and engaged with the abutment to prevent longitudinal movement of the shield with respect to said guard, an outer surface of the guard being generally flat and said abutment being spaced circumferentially from said surface, said shield being installed on said guard with said spring clip means being disposed generally parallel to said surface, rotation of said shield causing said spring clip means to deform outwardly and to seat against said abutment.

4,440,029

IMPACT FLOW METER

Hiroshi Tomiyasu, Yokohamashi, and Hiroaki Tanaka, Kawasakishi, both of Japan, assignors to Sankyo Dengyo Co., Ltd., Japan

Filed May 13, 1982, Ser. No. 377,966
Claims priority, application Japan, May 16, 1981, 56-073833
Int. Cl.³ G01F 1/30
U.S. Cl. 73—861.73 **10 Claims**



1. An impact flow meter for measuring a horizontal impact force produced by falling material, said flow meter comprising:

a frame;

a sensing plate having a front surface and a spaced opposite back surface;

hanging means hanging said plate substantially vertically on said frame thereby preventing material from adhering to said plate;

a flow guide mounted in the frame in front of the front surface of said plate at an inclination with the vertical for directing the falling material to said front surface of said plate whereby said plate is struck by said material; and

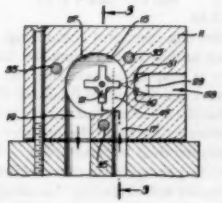
an impact force detector coupling the back surface of said plate to said frame for measuring the horizontal impact force of said material.

4,440,030

FLUID FLOW METER

Edwin Pounder, LaCanada; Alan J. Arena; Michael Pawlowski, both of Chino, and Adrian M. Totten, El Monte, all of Calif., assignors to Signet Scientific Co., El Monte, Calif.

Filed Feb. 26, 1982, Ser. No. 352,534
Int. Cl.³ G01F 1/6
U.S. Cl. 73—861.87 **15 Claims**



1. A fluid flow meter comprising:

a housing having means defining a substantially cylindrical cavity;

inlet and outlet conduit means closely spaced to each other and aligned substantially tangentially with the periphery of the cavity, for directing a fluid to flow through a major portion of the cavity, from the inlet conduit means to the outlet conduit means;

paddle wheel means mounted in the cavity for rotation in accordance with the fluid flow, the paddle wheel means

including a plurality of substantially flat, evenly-spaced paddles; and

means for sensing the angular velocity of the paddle wheel means and producing a corresponding signal;

wherein the paddle wheel means is mounted for rotation about an axis displaced from but parallel to the longitudinal axis of the cavity such that the fluid flow rotates the paddle wheel means in a prescribed direction over an extended range of Reynolds numbers, spanning both turbulent and laminar flow regimes.

4,440,031

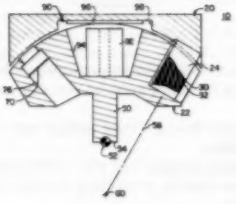
FORCE DETECTING SYSTEM FOR REMOTE CENTER COMPLIANCE DEVICE

Thomas L. De Fazio, Watertown, Mass., assignor to The Charles Stark Draper Laboratory, Cambridge, Mass.

Filed Jul. 31, 1981, Ser. No. 288,979

Int. Cl.³ G01L *5/16*

U.S. Cl. 73—862.04 **18 Claims**



1. A force detecting system for an RCC device comprising:

a first rigid, monolithic part;

a second rigid, monolithic part spaced from said first part;

compressible, shear deformable means interconnecting said first and second parts; and

at least one axial proximity displacement sensor for detecting the distance between said parts; each said axial proximity detector being disposed along conically-disposed radii from a center.

4,440,032

SAMPLER INCORPORATING A PURGE SYSTEM

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Apr. 9, 1982, Ser. No. 366,846

Int. Cl.³ G01N *1/14*

U.S. Cl. 73—863.84 **7 Claims**

1. Sample collecting apparatus comprising:

(a) an elongate hollow body having the form of a rod and which body is adapted to have one end extended into a container having a volume of fluid therein to be sampled, said body having a second end remote from said one end;

(b) sample gathering means at the one end of said body for insertion into the fluid to be sampled;

(c) sample outlet passage means connected to said sample gathering means and extending therefrom along said rod to a sample outlet port for delivery of a sample;

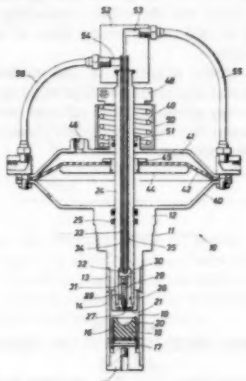
(d) purge line means extending from an inlet near the second end toward said sample gathering means for introduction of a purge fluid into said sample outlet passage means;

(e) selectively operable valve means for controlling operation of said purge line means into said sample outlet passage means to control flow of a purge fluid into said sample outlet passage means;

(f) wherein said purge line means extends along said elongate hollow body and terminates at a check valve means comprising said selectively operable valve means;

(g) wherein said sample outlet passage means and purge line means are coterminous at said one end connected together through said selectively operable valve means; and

(h) wherein said sample outlet passage means and said purge line means comprise first and second elongate hollow



conduits, the second within the first, the second being the purge line conduit and of thin wall construction and having a closed end with a passage through the wall thereof, and said selectively operable valve means comprises a means selectively closing said passage through said wall.

4,440,033

STARTING MOTOR DEVICE

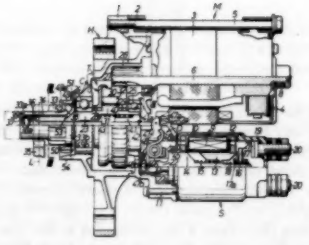
Norimitsu Kurihara, Wako; Katsuharu Kinoshita, Hanno; Masao Watanabe, Niiza; Toyohiro Sato, Nitta, and Takashi Kawazoe, Kiryu, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1981, Ser. No. 301,115

Claims priority, application Japan, Sep. 13, 1980, 55-126653; Mar. 7, 1981, 56-32918; Mar. 10, 1981, 56-34416

Int. Cl.³ F02N *15/06*

U.S. Cl. 74—7 A **32 Claims**



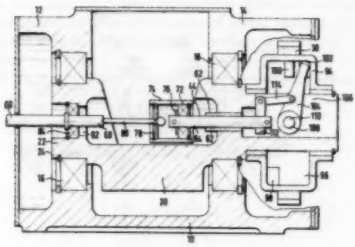
1. A starting motor device for an engine having a driven gear, comprising, in combination: an electric motor, an output shaft mounted for rotation but held against axial movement, one-way clutch means through which said electric motor may drive said output shaft in one direction, a pinion gear slidably mounted on said output shaft for axial movement but restrained from relative rotation, a rod slidably mounted coaxially within said output shaft for moving said pinion gear axially to engage and disengage said driven gear of said engine, shifting means including an electromagnetic device acting through resilient means for shifting said rod axially to engage and disengage said pinion gear with respect to said driven gear.

4,440,034

ECCENTRIC VIBRATOR WITH SHIFTING COUPLING

Hans-Georg Waschulewski, Mettmann, Fed. Rep. of Germany, assignor to Losenhausen Maschinenbau AG, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 239,698
Claims priority, application European Pat. Off., Apr. 5, 1980, 80101838.3
Int. Cl.³ B06B 1/16
U.S. Cl. 74—61 7 Claims



1. An eccentric vibrating machine comprising:
an unbalanced, rotatable first shaft carrying a first eccentric mass offset from the first shaft axis of rotation;
an unbalanced rotatable second shaft carrying a second eccentric mass offset from the axis of rotation;
a first gear fixed to the first shaft for rotation therewith;
a second gear meshing with the first gear and rotatably positioned on the second shaft, said second gear including an end face; and
coupling means for selectively coupling the second gear to the second shaft for rotation therewith and in a selected rotational phase relationship to said first shaft as both shafts are rotated and drivingly connected through said gears and coupling means, said coupling means comprising:
stop means associated with said second gear;
an entrainment device connected to the second shaft for rotation therewith and shiftable between at least two positions to selectively engage said stop means to variably establish driving connection between the second gear and second shaft at at least two different angular positional relationships therebetween, said entrainment device comprising:
a torque-transmitting lever pivotally mounted on the second shaft for pivotation about an axis extending transversely to the axis of rotation of said second shaft and for selective engagement by said lever with said stop means, whereby said lever transmits torque from said second gear to said second shaft; and
shifting means for shifting the entrainment device between said positions for selective engagement of said lever with said stop means.

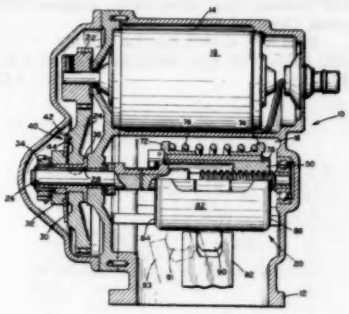
4,440,035

SLIP CLUTCH SPEED CHANGE MECHANISM

Donald H. Foulk, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed May 18, 1981, Ser. No. 264,505
Int. Cl.³ F16H 29/20, 29/22
U.S. Cl. 74—89.15 7 Claims

1. In a speed change mechanism comprising a travelling nut and a screw shaft drivably supporting said nut, a driven member rotatably journaled on said shaft, and a slip clutch mounted on said shaft, said clutch in axially thrusting frictional engagement with said driven member; an improvement comprising a pair of opposed annular slide members, a spring under constant compression interposed between said slide members, and retention means on said nut for axially restraining said slide members over said nut under force of said spring.

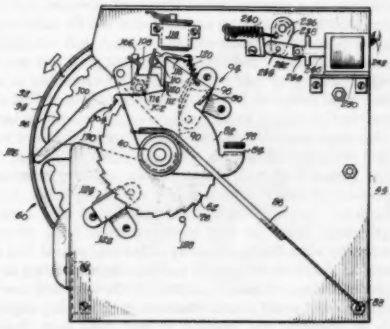


4,440,036

GAMING APPARATUS HAVING MANUALLY CONTROLLABLE OPERATING SPEED

Donald E. Hooker, Wilmette, and Roman A. Tojza, Chicago, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Division of Ser. No. 119,217, Feb. 7, 1980, abandoned. This application Sep. 25, 1981, Ser. No. 305,407
Int. Cl.³ F16D 41/12; A63B 71/00
U.S. Cl. 74—153 24 Claims

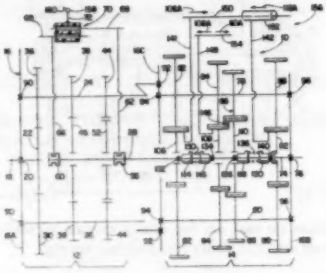


1. In an apparatus of the type wherein a rotatable shaft is journaled at opposite ends in a frame structure and has a ratchet wheel attached to one end portion of the shaft, a mechanism for driving a shaft to impart an initial speed of rotation that is directy proportional to the force that is applied to an operating handle by operator manipulation, said mechanism including a latch means which, when actuated, releases said mechanism for movement from a rest position in a first direction into engagement with said ratchet wheel for contacting and rotating said wheel and shaft through a first predetermined arc, an actuating means for actuating said latch means comprising an electrically energizable coil attached to said frame structure and adjacent said latch means when said mechanism is in its rest position, said frame structure including a protrusion for contacting a cam surface of said mechanism before said arc is completed and disengaging the same from said ratchet wheel, said shaft thereafter rotating at a speed proportional to the speed imparted to said wheel and shaft before disengagement.

4,440,037
SHIFT CONTROL

Robert J. Foxton, Livonia; David A. Kappheim, Southfield, and Russell C. Holmes, Troy, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 4, 1981, Ser. No. 318,168
Int. Cl.³ F16H 3/08, 3/02; B60K 20/00; G05G 5/10
U.S. Cl. 74—331 7 Claims



1. A shift rod housing assembly comprising:

a housing defining a first and a second generally parallel axially extending bores;

a first shift fork movable from a nondisplaced position, in a first axial direction only, a predetermined axial distance to a predetermined displaced postion, said first shift fork carried by a first shift rod for axial movement therewith, said first shift rod slidably received in said first bore and having an axially extending third bore therethrough;

a second shift fork movable from a nondisplaced position, in a second axial direction only, said predetermined axial distance to a predetermined displaced position, said second shift fork carried by a second shift rod for axial movement therewith, a portion of said second shift rod slidably received in said third bore in said first shift rod and another portion of said second shift rod extending in said first axial direction from said third bore in said first shift rod and carrying an abutment surface having a larger outer dimension than the inner diameter of said third bore, said abutment surface, in the axial positions of said first and second shift rods corresponding to the nondisplaced position of said first and second shift fork, being spaced from the opening to said third bore by an axial distance generally equal to said predetermined axial distance whereby axial displacement of either one of said first and second shift rods to an axial position corresponding to the predetermined displaced position of the shift fork carried thereby will result in said abutment surface being adjacent to or engaging the opening to said third bore thereby positively preventing simultaneous displacement of said first and second shift forks to the predetermined displaced positions thereof;

a third shift fork movable from a nondisplaced position in either one of the first or second axial directions to either of two predetermined displaced positions, said third shift fork carried by a third shift rod for axial movement therewith, said third shift rod slidably received in said second bore;

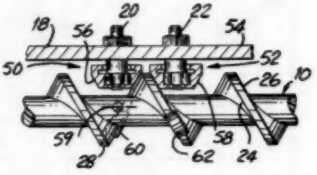
means associated with said housing for selectively displacing any selected one of said first, second and third shift rods from the nondisplaced position thereof to the predetermined displaced positions thereof independently of displacement of the other two of said first, second and third shift rods; and

positive mechanical interlock means operable in combination with said abutment surface for positively preventing movement of any one of said first, second and third shift rods to the predetermined displaced positions thereof unless the other two of said first, second and third shift rods are in the nondisplaced positions thereof.

4,440,038
LEAD SCREW AND FOLLOWER ASSEMBLY

John T. Potter, Locust Valley, N.Y., assignor to Iquad Company Incorporated, Locust Valley, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,189
Int. Cl.³ F16H 1/18, 27/02, 1/20
U.S. Cl. 74—424.8 R 3 Claims



1. Screw and follower apparaus, comprising:

a shaft radially flexible along the length thereof and having a helical ridge formed of three continuous surfaces uniformly longitudinally arranged on the surface of said shaft for forming a lead screw;

said surfaces comprising a flat outer helical surface and two slanted sides extending outwardly from said outer helical surface to the root of said shaft;

follower means including a frame member substantially coaxially arranged with said shaft and a plurality of bearing means mounted on said frame member and in contact with said three surfaces of said helical ridge for linearly translating said follower upon rotation of said shaft and for stabilizing said shaft against flexing;

said plurality of bearing means comprising a pair of conical roller bearings having tapered outer race surface means for rolling line contact against said slanted sides of said helical ridge;

means mounting said pair of conical roller bearings to said frame member with their axes normal to the axis of said shaft and in a common plane, longitudinal spaced relation for stradling a single raised portion of said ridge and for bearing in a direction substantially normal to the axis of said shaft in rolling line contact against opposite slanted sides extending from a common portion of said flat outer helical surface of said ridge substantially along the length of said ridge as said shaft is rotated;

said bearing means further comprising a pair of cylindrical roller bearings having outer circular race surface means for rolling line contact against said flat outer helical surface of said ridge;

means mounting said pair of cylindrical roller bearings to said frame member with their axes angled for bearing in a direction opposite to the bearing direction of said conical roller bearings in rolling line contact against said flat outer helical surface on opposite sides of the axis of said shaft for substantially the length thereof as said shaft is rotated;

said bearing means constituting opposing bearing means preventing flexure of said shaft within said frame.

4,440,039
REMOTE CONTROL MIRROR

Charles Bramer, North Shores, Mich., assignor to Lacks Industries, Inc., Grand Rapids, Mich.

Filed Aug. 7, 1981, Ser. No. 290,979
Int. Cl.³ F16C 1/10
U.S. Cl. 74—501 M 6 Claims

1. A remote control rear view mirror for vehicle use and comprising;

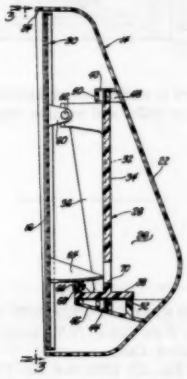
a housing having a mirror member and its operating mechanism mounted therewithin and means for mounting the housing itself externally on a vehicle,

control means adapted to be mounted within the vehicle and including cable means responsive to push-pull and rotary movement for operative control of the mirror member mounted within the housing,

a mirror supporting member provided in said housing as part of said operating mechanism and having the mirror member mounted thereon and pivotal about a relatively fixed horizontal axis for vertical viewing adjustment,

means for mounting said supporting member within said housing and for pivotal movement about a relatively fixed vertical axis to obtain lateral viewing adjustment of the mirror member,

a small pinion gear and means for mounting said pinion gear



on said mirror supporting member at a location relatively spaced from one of said vertical and horizontal axes that afford viewing adjustment for the mirror member and to turn about an axis relatively spaced from the other of said viewing adjustment axes,

a gear toothed arcuate segment provided on the back side of the mirror member and projecting outwardly and normal thereto,

said gear segment being formed and disposed for operative engagement with said pinion gear,

and said cable means including a sheathed cable operatively connected to said pinion gear for turning it to effect adjustment of the mirror member about one of said axes via said gear segment and for exerting axial force thereon to effect rotational movement of the supporting member and thereby adjustment of the mirror member mounted thereon about the other of said axes.

4,440,040

MULTIPLE MODE CONTROL LEVER ASSEMBLY

Carl E. Kittle, and James E. Roach, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 23, 1981, Ser. No. 333,602

Int. Cl.³ G05G *5/06*

U.S. Cl. 74—527 **22 Claims**

1. A multiple mode control lever assembly comprising:

a housing;

a control lever rotatably mounted in the housing;

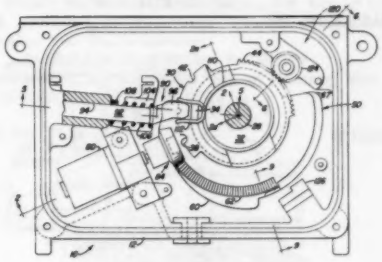
friction means for releasably coupling with the control lever to resist the rotation thereof;

an arm movable in the housing;

resilient means for releasably coupling between the arm and the control lever to urge the control lever from a displaced position to a neutral position;

detent means for releasably coupling with the control lever to hold the control lever in the displaced position against the bias of the resilient means; and

a unitary index member operatively engaging the friction means, the arm and the detent means, the index member



being rotatable in the housing to couple and uncouple the friction means from the control lever, to couple and uncouple the arm from the resilient means and to couple and uncouple the detent means from the control lever.

4,440,041

WINCH APPARATUS

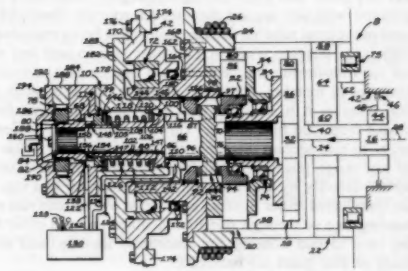
Randall R. Bendtsen, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/01252, § 371 Date Sep. 17, 1981, § 102(e) Date Sep. 17, 1981, PCT Pub. No. WO83/01089, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 17, 1981, Ser. No. 309,341

Int. Cl.³ F16H *3/44*; F16D *25/10*

U.S. Cl. 74—753 **14 Claims**



1. In a winch apparatus (8) having a shift control mechanism (10) including a shaft (66) rotatably supported within a housing (42) on a central axis (28), the improvement comprising:

first and second piston members (99,100) fixedly mounted on the shaft (66), axially slideably disposed within the housing (42), and at least in part defining with the housing (42) first and second annular chambers (138,142) having substantially equal operating volumes;

first means (122) for fluidically urging the first piston member (99) and the shaft (66) in a first direction toward a first piston by pressurizing the first chamber (138);

second means (124) for fluidically urging the second piston member (100) and the shaft (66) in a direction opposite the first direction toward a second position by pressurizing the second chamber (142); and

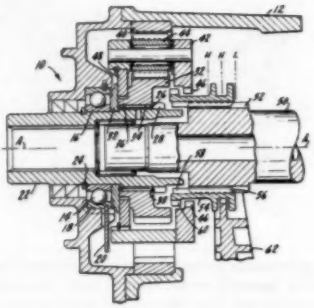
centering means (126) for mechanically centering the shaft (66) between the first and second positions in response to abutment with the piston members (99,100) and the housing (42).

4,440,042

HELICAL PLANETARY GEAR ASSEMBLY

John W. Holdeman, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 29, 1981, Ser. No. 287,962
Int. Cl.³ F16H 3/44
U.S. Cl. 74—785 9 Claims



7. A helical planetary gear assembly comprising a housing, a bearing having inner and outer races, one of said races secured to said housing, a first member journalled by the other of said races and restrained axially in one direction and radially thereby, a second member journalled in said housing, a sun gear secured to said first member and restrained axially in said one direction thereby, a thrust washer contiguous to said other bearing range and said sun gear, said sun gear bearing restrained axially in the other direction by said thrust washer, and said other bearing race a ring gear secured to said housing, a planet carrier free to float radially, a plurality of planet gears supported by said carrier in meshing relationship with said sun and ring gears, said gears having helical gear teeth, and a collar engaged with said second member for rotation therewith and axial movement relative thereto, said collar being movable to a high-range position wherein it is engaged with said first member for transferring torque from said first member directly to said second member, and being movable to a low-range position wherein it is engaged with said carrier for transferring torque from said first member through said gears, carrier and collar to said second member, whereby when said collar is in its low-range position thrust loads on said ring gear are absorbed directly by said housing, thrust loads on said sun gear are transferred either through said thrust washer and said other bearing race or through said first member and said other bearing race to said housing for absorbtion thereby, and torque loads on said gears are balanced.

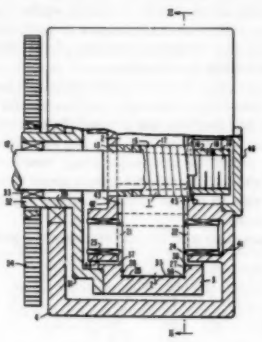
4,440,043

FIXED RATIO TRACTION ROLLER TRANSMISSION WITH TAPERED LOADING MEANS

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Mar. 3, 1982, Ser. No. 354,371
Int. Cl.³ F16H 13/06, 15/00, 13/02, 13/00
U.S. Cl. 74—798 6 Claims

1. A traction roller transmission comprising: a traction ring structure having an inner traction surface; a sun roller structure centrally disposed within said traction ring structure and having a circumferential traction surface spaced from the inner surface of said traction ring structure; planetary traction rollers supported in the space between, and in engagement with, the sun roller structure and the traction ring structure, at least one of said sun roller and said traction ring structures having a tapered support surface; a tightly coiled spring having a cylindrical traction surface and a tapered opposite surface disposed on said tapered support surface; and adjustment means for forcing said coiled cylindrical spring onto said tapered support surface to thereby force said coiled cylindrical spring against



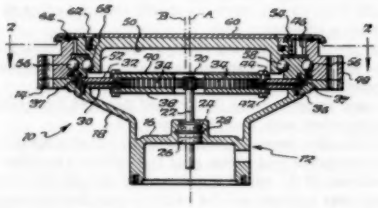
said traction rollers to cause firm engagement of said traction rollers with said sun roller and traction ring structures.

4,440,044

TWO STAGE SPEED REDUCER

Werner H. Heller, West Valley, N.Y., assignor to UMC Industries, Inc., Stamford, Conn.

Filed Jun. 22, 1981, Ser. No. 275,499
Int. Cl.³ F16H 1/28
U.S. Cl. 74—804 8 Claims



1. A speed reducer, comprising:

a casing;

a primary speed reduction stage including an output element;

an output stage ring gear fixed to said casing;

means for mounting said output element for rotation with respect to said casing;

an output stage planetary gear in mating engagement with said ring gear and mounted for orbital movement therewithin by said first mentioned means;

said first mentioned means including an eccentric rigidly fixed to said output element, outer bearings between said eccentric and said casing, and inner bearings between said eccentric and said output stage planetary gear;

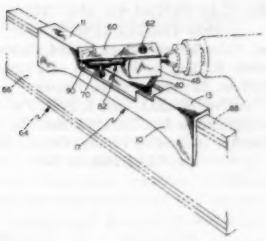
said eccentric contains the inner and outer races for said outer and inner bearings, respectively; and

said casing and said output stage planetary gear contain the outer and inner races for said outer and inner bearings, respectively.

4,440,045
CHAIN SAW SHARPENER

Frank J. Aksamit, 12605 Blackberry Row, Bayonet Point, Fla. 33567

Filed Jun. 1, 1982, Ser. No. 383,751
Int. Cl.³ B23D 63/16
U.S. Cl. 76—25 A 22 Claims



1. A chain saw sharpener fixture comprising:

a. A frame of substantially inverted U-shaped cross section defining a channel for receiving the cutter bar of a chain saw and comprising:

(1) a web having a front web portion and a rear web portion, both having a lower surface and further having a sharpening opening and a depth gauge opening disposed therein between said front and rear web portions and communicating with said channel; and

(2) two sidewalls depending from opposite sides of said web and structurally connecting said front and rear web portions;

b. A support bracket extending laterally from one of said sidewalls having an elongated hole disposed therein, with the axis of said elongated hole lying parallel to said sidewall, and further having:

(1) a flat, horizontal upper surface having front and rear edges tapering toward each other as distance from said sidewall increases and forming interior angles of 35° with said sidewall; and

(2) front and rear lines marked on said upper surface, adjacent to said front and rear edges, respectively, tapering toward each other as distance from said sidewall increases and forming interior angles of 30° with said sidewall;

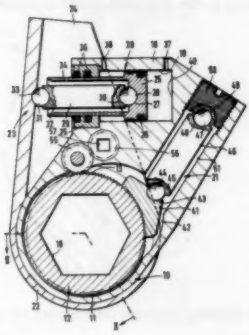
c. A means for guiding a sharpening tool, comprising a body having a flat lower surface with parallel front and rear edges and a transverse hole extending horizontally through said body, the axis of said transverse hole being parallel to said front and rear edges of said lower surface, which guide means is supported by said support bracket and is positionable thereon with said front edge of said lower surface aligned with either said front edge of said support bracket or said front line marked on said support bracket or with said rear edge of said lower surface aligned with either said rear edge of said support bracket or said rear line marked on said support bracket; and

d. Means inserted through said hole in said support bracket for attaching said guide means to said support bracket in said multiplicity of positions.

4,440,046
POWER WRENCH

Kurl-Richard Hirtsiefer, Neunkirchen; Johann Müller, Much-Nesshoven; Kurt Walterscheid, Ruppichteroth, and Paul-Heinz Wagner, c/o Maschinenfabrik Wagner GmbH & Co. KG, D-5203 Much-Birrenbachshöhe Nr., Fed. Rep. of Germany, assignors to Paul-Heinz Wagner, Much-Birrenbachshöhe, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 238,079
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008332; Mar. 5, 1980, 3008381
Int. Cl.³ B25B 13/46
U.S. Cl. 81—57.39 16 Claims



1. A power wrench comprising:

a wrench head in which a ring containing a non-circular internal profile is supported;

a ratchet device moving said ring only in one direction of rotation of said wrench head;

a solid extension of said wrench head;

a support element pivoted at said wrench head;

a piston-cylinder unit including a piston rod and a cylinder, said cylinder being integral with said solid extension of said wrench head,

the first end of said piston-cylinder unit in contact with said solid extension of said wrench head and the second end of said unit in contact with said support element;

wherein the distance between the center of said wrench head and said first end is substantially equal to the distance between the center of said wrench head and said second end;

whereby said piston moves directly out of said solid extension of said wrench head to press against said support element and impart a turning motion to said wrench head, and

wherein the cylinder of said piston-cylinder unit is rigidly connected to said wrench head extension and the rod of said piston-cylinder unit flexibly engages said support element and also flexibly engages the rear side of the piston of said piston-cylinder unit.

4,440,047
UNI-DIRECTIONAL DRIVE WRENCH

Christopher B. Robbins, 2719 N. Pollard, Arlington, Va. 22207

Filed Dec. 31, 1981, Ser. No. 336,335
Int. Cl.³ B25B 13/12
U.S. Cl. 81—179 10 Claims

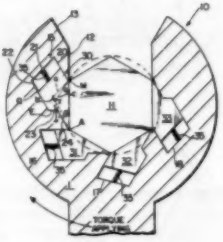
1. A wrench for turning a nut of the type having an even number of flat sides, comprising:

at least two drive means positioned to apply turning torque simultaneously to opposing sides of a nut upon rotation of the wrench in a drive direction, and to slip about the nut upon turning of the wrench in the opposite direction while

the center of the nut and the center of the wrench remains substantially coincident,

each drive means including a guideway open toward the wrench interior and having essentially parallel first and second sides, as viewed in the axial direction, a drive insert in each guideway slidable into and out of the guideway and urged outwardly by a spring means, said drive insert having first and second parallel sides parallel to the slidable along said first and second parallel sides of the guideway, said drive insert also having an end face which engages a flat side of the nut,

the width of each insert, between said first and second sides, being large enough for the said end face of the drive insert to engage the corresponding flat side of a nut across its full face, taken in the circumferential direction,



means for limiting outward movement of the drive insert, and

an acute angle between a line extending through the guideway parallel to its sides and the plane of said end face being greater than an acute angle between said end face and a tangent to a circle through the corners of the nut, so that upon reverse turning of the wrench, relative to the nut, each drive inert can move into its respective guideway, to allow the nut to slip past that drive insert, and said acute angle being sufficiently small that upon turning the wrench in the driving direction, the drive insert will exert a driving force on the nut, and not be forced into the guideway.

4,440,048

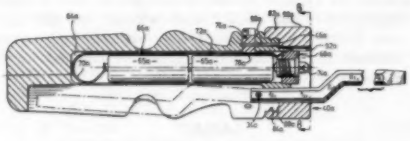
FASTENER DRIVING DEVICE WITH MULTIPLE BITS

Larry G. H. Stevens, Georgetown; Edmund G. F. Sweet, Oakville, and Franklin V. Vresk, Kitchener, all of Canada, assignors to MIC Manufacturing and Machine Works Ltd., Waterloo, Canada

Continuation-in-part of Ser. No. 165,707, Jul. 3, 1980, Pat. No. 4,327,790. This application Jul. 9, 1981, Ser. No. 281,785

Int. Cl.³ B25G *1/00*

U.S. Cl. 81—440 **28 Claims**



1. A driving device for driving rotatable fasteners, said driving device comprising a handle, a plurality of driving bits spaced about said handle, pivot means pivotally connecting each of said bits to said handle adjacent to one end thereof for movement of each of said bits from a stored position in which said bit lies alongside said handle to an operative position in which said bit extends beyond said one end of said handle and lock means rotatably supported on said handle and operable between said bit and said handle to lock said bit in said operative position, said lock means including a passageway selectively alignable with each of said bits by rotation of said lock means relative to said handle, said bit passing through said passageway in moving from said stored to said operative position said lock means having an abutment surface adjacent said passageway, rotation of said lock means relative to said handle moving said abutment surface into alignment with said bit to prevent pivotal movement thereof about said pivot means, said pivot means being located on said handle relative to said lock means for movement of said bits from said stored position toward said operative position regardless of the position of said lock means.

4,440,049

FAIL-SAFE ELECTRICAL CONNECTION TERMINAL AND TIGHTENING TOOL

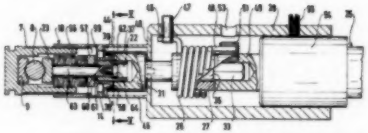
Andre Borne, Villeurbanne; Joseph Vallod, Caluire et Cuire, and Rene Curvat, Rillieux la Pape, all of France, assignors to CGEE Alsthom, Levallois-Perret, France

Division of Ser. No. 307,552, Oct. 1, 1981, Pat. No. 4,413,876. This application Jun. 20, 1983, Ser. No. 506,089

Claims priority, application France, Oct. 2, 1980, 80 21114

Int. Cl.³ B25B *23/14*

U.S. Cl. 81—467 **2 Claims**



1. A tool for tightening a fail-safe electrical connection terminal, said terminal comprising a slotted bolt for receiving an electrical conductor, a tapped cylindrical cap screwed onto the bolt to clamp the conductor therein, said cap being closed at one end by a plate having a central hole, a shoe for applying the clamping force to the conductor, a rod having one end integral with the shoe and being slidably mounted in said hole in the plate, and a compression spring interposed between the shoe and the palte of the cap, said shoe and spring being housed inside the cap, said tool comprising:

a torque limiter,

a hollow casing and a drive member passing through the casing and made fast to the torque limiter,

the drive member comprising a sleeve having a polygonal socket of the same shape as the polygonal end of the central boss of the cap, the casing being made fast to a fixed portion of the torque limiter, and having an end equipped with two lugs surrounding the sleeve, and

the drive member further comprising a lock having two locking blades each of which ends in a hook,

said lugs on the casing fitting in between the lugs on the cap and the hooks of the lock engaging the hooks of the cap.

4,440,050

DRIVE MECHANISM FOR A FEED SCREW

Franz Kagerer, Munich, Fed. Rep. of Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 6, 1981, Ser. No. 260,858

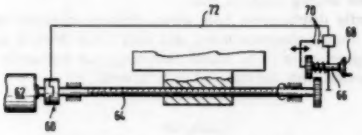
Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018520

Int. Cl.³ B23B *21/00*

U.S. Cl. 82—21 B **3 Claims**

1. A drive mechanism, comprising a drive motor; an elongate threaded spindle supported for rotation about a first axis and having a first gear provided at a first location thereon coaxial with said first axis; electromagnetic coupling means cooperable with said motor and said spindle for selectively drivingly coupling said motor to said spindle; a carriage sup-

ported for movement axially of said spindle and having means thereon defining a nut which threadedly engages said spindle, rotation of said spindle effecting axial movement of said carriage; a handwheel and a second gear supported for rotation about a second axis substantially parallel to said first axis and supported for axial movement between first and second positions, said second gear being fixed against rotational and axial movement relative to said handwheel and being respectively



drivingly engaged with and free of engagement with said first gear in said first and second positions; and including control means responsive to axial movement of said handwheel and cooperable with said electromagnetic coupling means for causing said electromagnetic coupling means to drivingly couple and uncouple said motor and said spindle when said handwheel and said second gear are in said second and first positions, respectively.

4,440,051

APPARATUS FOR CUTTING AND TRANSPORTING SHEETS OF PAPER OR THE LIKE

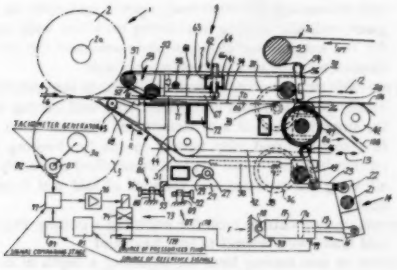
Kurt Aykut, Hamburg, Fed. Rep. of Germany, assignor to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,469

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130025

Int. Cl.³ B26D *1/62*; B65H *35/08*

U.S. Cl. 83—72 **19 Claims**



1. Apparatus for manipulating webs consisting of paper or other flexible material, comprising severing means for subdividing a running web of paper or the like into a series of discrete sheets each of which has a leader normally advancing along a first path, said severing means including at least one mobile component and means for moving said component at a plurality of speeds; a sheet intercepting device adjacent to said first path and including a pair of sections defining a second path wherein successive sheets of said series are transported in a predetermined direction; shifting means actuatable to adjust said intercepting device with reference to said severing means so as to change the position of said second path relative to said first path; and means for actuating said shifting means in response to changes in the speed of said component.

4,440,052

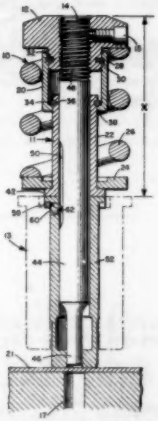
PUNCH ASSEMBLY WITH UNITARY STRIPPER SPRING ASSEMBLY

Ralph L. Weisbeck, Williamsville, N.Y., assignor to Unipunch Products, Inc., Buffalo, N.Y.

Filed Sep. 12, 1980, Ser. No. 186,430

Int. Cl.³ B21D *45/04*; B26F *1/14*

U.S. Cl. 83—140 **21 Claims**



1. A punch assembly for punching a workpiece comprising:

a punch having a punching end, a fastening end, and a detent intermediate said punching and fastening ends;

a unitary stripper spring assembly fastenable to said fastening end of said punch to remove said punch from said workpiece, said unitary stripper spring assembly including a stripper spring, a head adjustably fastenable to said fastening end of said punch, a washer, said stripper spring being mounted between said head and said washer, and a telescopic retainer having an upper retainer and a lower retainer in reciprocal slidable relationship to one another, said telescopic retainer interlinking said head and said washer and responsive to a force exerted on said head for allowing said unitary stripper spring assembly to contract, and fastening means for adjustably fastening said unitary stripper assembly on said fastening end of said punch, said stripper spring and said fastening means being coupled together so that said stripper spring and said fastening means are separable from said punch as a unit; and

punch guide means encircling said punching end of said punch for guiding said punch toward said workpiece, said punch guide means including retaining means coactive with said detent on said punch for retaining said punch guide means on said punch.

4,440,053

WIRE-LAYING HEAD

Yoshitsugu Suzuki, Mishima; Syogo Iizuka, Gotenba; Shigeo Kajiyama, Shizuoka; Kenji Usui, Gotenba, and Masahiro Kobayashi, Susono, all of Japan, assignors to Yazaki Corp., Tokyo, Japan

Division of Ser. No. 223,233, Jan. 8, 1981, Pat. No. 4,363,165, which is a division of Ser. No. 80,682, Oct. 1, 1979. This application Jun. 18, 1982, Ser. No. 389,915

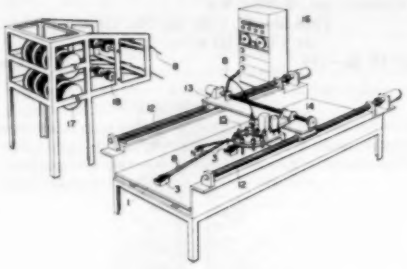
Claims priority, application Japan, Sep. 29, 1978, 53-120280; Nov. 20, 1978, 53-142212; Nov. 20, 1978, 53-142213

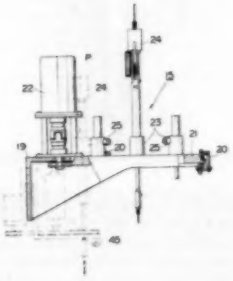
Int. Cl.³ B26D *5/20*

U.S. Cl. 83—282 **3 Claims**

1. A wire-laying head adapted to travel over a worktable for use in the manufacture of a wire harness comprising: a frame; wiring jig mount rotatably mounted on said frame; a plurality

of equally spaced wiring jigs located on top of said of jig mount; a clamping jig movably mounted on the bottom side of said frame for contacting a wire; guide pipes disposed on said





wiring jig mount for guiding wires inserted through said wiring jig; and means selectively connectable to said wiring jigs for lowering and raising said wiring jigs at a predetermined position.

4,440,054

TRAVELING SAW WITH A SOUND PROTECTION HOOD

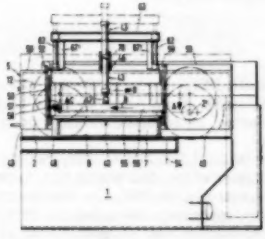
Friedrich W. Elhaus, Dorfstrasse 21, 7761 Moos, Fed. Rep. of Germany

Filed Sep. 28, 1981, Ser. No. 306,225

Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117684

Int. Cl.³ B23Q *11/08*; B23D *47/10*

U.S. Cl. 83—390 **11 Claims**



1. An improved circular saw for sawing sectional material, particularly of light metal, of the type wherein the saw blade is adapted to be moved horizontally above a table upon a carriage and to be lifted during each sawing cycle into a position above the material to be sawed for return of the saw blade, the carriage being displaceable along a horizontal guide means upon a cantilever beam which is guided for lifting movement upon a vertical column, the improvement comprising:

a sound protection hood mounted on the cantilever beam, and substantially covering the saw blade during the horizontal and vertical movements of the saw blade, said hood having at least one cut-out for the material to be sawed and being lowered against the table for sound dampening in the sawing position; and

upwardly displaceable hold down devices arranged upon the sound protection hood, said hold down devices being designed so as to be sound absorbing and resiliently engageable with the material to be sawed.

4,440,055

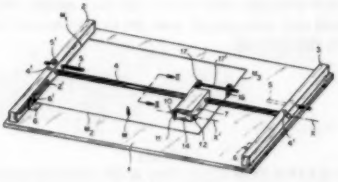
MAT CUTTING DEVICE

Daniel Gelfand, 200 Winston Dr., Cliffside Park, N.J. 07010

Filed Dec. 31, 1981, Ser. No. 336,086

Int. Cl.³ B26D *5/08*

U.S. Cl. 83—525 **10 Claims**



1. A mat cutting device comprising:

a planar base for supporting a mat to be cut;

a first support at one side of said base;

a second support at an opposite side of said base;

a guide rod mounted between said first and second supports, said guide rod having a longitudinal axis parallel to said base;

an elongated cutting head having a blade at one end thereof and mounted at the other end opposite said blade on said guide rod, said cutting head being provided with means for the longitudinal along displacement and the pivotal displacement of said head about said axis;

a movable stop mounted on said first support, said stop being axially adjustable and engageable with said cutting head for stopping same at a predetermined distance from said first support, said stop having means for keeping said cutting head with said blade thereof tilted upwardly for allowing the insertion and removal of said mat therebeneath;

means on said cutting head for adjusting a cutting angle of said blade with respect to said base; and

means on said cutting head for adjusting a depth of cut of said blade in said mat.

4,440,056

ENVELOPE WAVE SHAPE SIGNAL GENERATOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

Koichi Kozuki; Akira Nakada, and Shigeru Yamada, all of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation of Ser. No. 158,917, Jun. 12, 1980. This application Mar. 17, 1982, Ser. No. 359,117

Claims priority, application Japan, Jun. 15, 1979, 54-76172

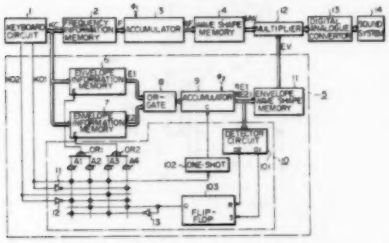
Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.26 **11 Claims**

1. An envelope waveshape generator for an electronic musical instrument having a keyboard including a plurality of keys comprising:

control means for generating a control signal responsive to the speed of depression or release of a key operation; and

envelope waveshape address generating means connected to said control means for receipt of said control signal for generating an envelope waveshape address having at least two linear portions of different slopes in which an amplitude value of said envelope waveshape address progresses timewise from a first value to a second value without reverse progression, and for changing the slope of one of said portions relative to the other of said portions at least once in response to said control signal, said amplitude value of said envelope waveshape address at a point where said slope changes being different from said second value.



4,440,057

ELECTRONIC MUSICAL INSTRUMENT WITH IMPROVED INPUT DEVICE

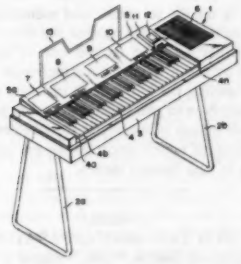
Masanori Ishibashi, Ome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 210,410, Nov. 25, 1980, abandoned. This application Aug. 18, 1982, Ser. No. 409,282

Claims priority, application Japan, Nov. 30, 1979, 54-155288

Int. Cl.³ G10H *1/00*

U.S. Cl. 84—1.01 **8 Claims**



1. An electronic musical instrument comprising;

a plurality of performance keys selectively operable to cause the production of sounds corresponding to respective notes,

detecting means coupled to said performance keys for detecting the operation of said performance keys,

musical tone generating means coupled to said detecting means for generating musical tones designated by operated performance keys, and

an input device coupled to said musical tone generating means for inputting tone information such as volume and timbre of tones selectively generated by said musical tone generating means upon operation of said performance keys, and

wherein said input device further comprises:

a plurality of display devices, each having a plurality of display elements for displaying tone status of the musical tones generated by said musical tone generating means,

a plurality of transparent touch switches located over said display devices for selectively inputting tone information,

drive means coupled to said display devices and to said touch switches, and being responsive to operation of respective touch switches to cause said display elements respectively corresponding to the operated touch switches to visually display tone information input by the operated touch switches, and

means coupled to said touch switches and to said musical tone generating means for transferring said tone information inputted by said touch switches to said musical tone generating means, whereby said musical tone generating means generates musical tones according to the tone information inputted by said touch switches.

4,440,058

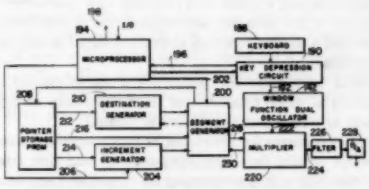
DIGITAL TONE GENERATION SYSTEM WITH SLOT WEIGHTING OF FIXED WIDTH WINDOW FUNCTIONS

Steven C. Bass, Stockwell, and Thomas W. Goeddel, West Lafayette, both of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Continuation of Ser. No. 369,976, Apr. 19, 1982, abandoned. This application Jun. 2, 1983, Ser. No. 500,552

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.26 **46 Claims**



1. An electronic musical instrument comprising:

player operated tone selection means including a keyboard with playing keys for selecting a tone to be played by the instrument,

a tone generator responsive to said tone selection means comprising a first memory in which one cycle of a waveform is stored and means repetitively for reading the stored waveform out of the memory at fixed rate regardless of which key of the keyboard is actuated but selectively adjusting the period of time between successive readings depending upon the frequency of the tone selected to thereby produce a cyclically recurring series, each series comprising a limited number of said waveforms,

means for generating a time varying amplitude envelope for the waveforms having generally an attack portion, a sustain portion, and a decay portion in response to the actuation and subsequent release of a key of the keyboard,

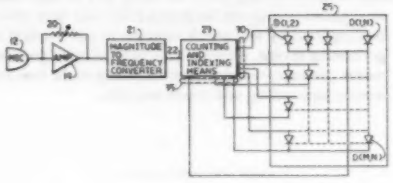
harmonic content control means for reading a second memory and adjusting the amplitude levels of the waveforms in the series independently of each other and varying with time the amplitudes of at least some of the waveforms in the series relative to others of the waveforms therein for different portions of the amplitude envelope based on data read out of the second memory to thereby produce a wavetrain of time varying harmonic content.

4,440,059

SOUND RESPONSIVE LIGHTING DEVICE WITH VCO DRIVEN INDEXING

Gray H. Hunter, Atlanta, Ga., assignor to Daniel Lee Egolf, San Francisco, Calif., a part interest

Filed Dec. 18, 1981, Ser. No. 332,223
Int. Cl.³ A63J 17/00
U.S. Cl. 84—464 R 4 Claims



1. A light organ comprising:

an M×N array, M and N being integers greater than one, of light-emitting devices mounted in an arrangement wherein each light-emitting device occupies a unique position on each of a pair of orthogonal axes characterized by a coordinate pair (k,l), wherein k is equal to integer between 1 and M and l is equal to an integer between 1 and N;

each of said light-emitting devices being characterized by a first terminal and a second terminal and further characterized by said light-emitting device being activated to a light-emitting condition in response to a concurrent presence of a first terminal activation signal at said first terminal and a second terminal activation signal at said second terminal;

a sound trandsucer for providing a sound output signal having a value proportional to the intensity of a sound field in which said transducer is located;

connection means for providing M first common connection points of said first terminals, each of said first common connection points connecting all of said first terminals for said light-emitting devices at point (k,l) for which k is identical and for providing N second common connection points of said second terminals, each of said second common connection points connecting all of said second terminals for said light-emitting devices at said point (k,l) for which 1 is identical;

a first indexing means including a first counter means for sequentially providing said first activation signal to each of said M first common connection points, one at a time, in response to a first clock signal;

a second indexing means including a second counter means for sequentially providing said second activation signal to each of said N second common connection points, one at a time, in response to a second clock signal;

a first magnitude to frequency conversion means connected to said sound transducer and said first counter means for providing said first clock signal characterized by a frequency proportional to the magnitude of said sound output signal;

a second magnitude to frequency conversion means connected to said sound transducer and said second counter means for providing said second clock signal characterized by a frequency proportional to the magnitude of said sound output signal;

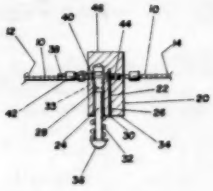
means for independently adjusting the quiescent frequencies of said first and second clock signals in response to a predetermined magnitude of said sound output signal.

4,440,060

ACCELERATION ACTUATED LANYARD DEVICE

George A. Berkley, Brigham City, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Jul. 23, 1982, Ser. No. 401,182
Int. Cl.³ F41F 5/02
U.S. Cl. 89—1.5 D 7 Claims



1. A safety coupling for coupling first and second members comprising,

a housing having formed therein first and second bores and a slot, said slot being transverse to said bores, said housing having a connection to said first member; an attachment ring having a connection to said second member and normally disposed in said slot in encircling relation to both of said bores;

a first pin in one of said bores normally encircled by and retaining said attachment ring in said slot, said first pin being a shear pin;

acceleration responsive means including a second pin in the second one of said bores and a biasing means for exerting a biasing force on said second pin, said second pin being stronger than said first pin and normally biased by said biasing means to a position partially withdrawn from said second bore, in which position said second pin is ineffective to retain said attachment ring in said slot when force is applied to said first and second members to pull them apart, said first pin shearing upon the application of such force pulling said members apart whereby said safety coupling is unable to retain said members coupled, said second pin being moved against the force of said biasing means further into the second one of said bores to be encircled by and to retain said attachment ring in said slot notwithstanding the application of force to said first and second members to pull them apart when said acceleration responsive means is subjected to accelerations that produce a force of acceleration strong enough to overcome the force of said biasing means.

4,440,061

GUN TRAVERSE APPARATUS

Roland A. Magnuson, Seattle, Wash., assignor to PACCAR Inc., Bellevue, Wash.

Filed Apr. 20, 1981, Ser. No. 255,359
Int. Cl.³ F41G 5/04
U.S. Cl. 89—41 H 8 Claims

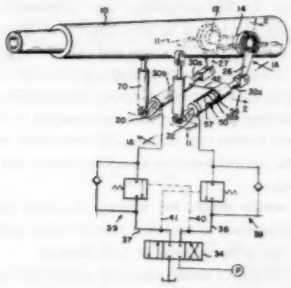
5. Gun traverse apparatus for a weapon of the type having a carrier and a gun mounted for elevation and traverse on said carrier, comprising:

said gun having opposed trunnions supported on said carrier for elevation positioning about a horizontal gun pivot axis,

said trunnions being mounted in laterally spaced eccentrics which rotate about horizontal eccentric pivot axes offset from said gun pivot axis, and

gun traverse control means for simultaneously rotating said eccentrics in equal and opposite directions for pivoting said gun in traverse relative to said carrier about a vertical pivot axis, said carrier being a mobile carrier and including means for controlling the direction of movement of said carrier, including secondary control means respon-

sive to traverse movement of the gun relative to the carrier for operating the carrier directional control means



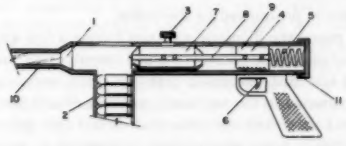
when a predetermined limit of traverse is reached by said gun.

4,440,062

REVERSIBLE BOLT FOR FIREARMS

Sidney J. McQueen, 414 Coors, S.W., Albuquerque, N. Mex. 87105

Filed Aug. 7, 1981, Ser. No. 290,857
Int. Cl.³ F41C *5/06, 11/00*
U.S. Cl. 89—128 **3 Claims**



1. A bolt for use in firearms of the automatic or semi-automatic type, the bolt comprising a front bolt, a rear bolt and two side rails, wherein the front bolt is removeably but rigidly connected to the rear bolt by means of assembly pins and the side rails; and wherein the front bolt is cantilevered from the rear bolt by the side rails; and wherein the front bolt has a cylindrical center section, a first caliber section and a second caliber section; and wherein an ejector groove runs the length of the front bolt; and wherein a cocking lever is installed in the center section; and wherein the first caliber section has a firing face with a fixed firing pin, and the first caliber section has an extractor mechanism; and wherein the second caliber section has a firing face, and wherein the second caliber section has a fixed firing pin and an extractor mechanism; and wherein the front bolt may be dissassembled from the side rails, and the front bolt reversed end for end, and reassembled to the side rails.

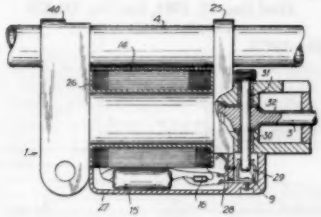
4,440,063

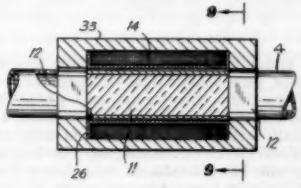
GUN OPERATED ELECTRICAL FIRING DEVICE

Roy A. Zangrando, Boonton, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 13, 1982, Ser. No. 339,244
Int. Cl.³ F41D *11/04*
U.S. Cl. 89—135 **6 Claims**

1. A gun operated firing device which generates power to fire electrically primed ammunition in a gas-operated gun having a sliding bolt carrier comprised of a bolt, a firing pin and a retaining pin to fix the firing pin to the bolt carrier, wherein said bolt carrier slides on a receiver tube; comprising an electric circuit, which includes a magnet fixed in said receiver tube wherein said receiver tube is non-magnetic, and a magnetically permeable yoke affixed to said bolt carrier in freely sliding relationship with said non-magnetic receiver tube; a coil of insulated electric wire mounted in said yoke exterior to said receiver tube, a capacitor across the output of said coil; a diode between the capacitor and the coil; and a primer, wherein said firing pin connects said circuit to said





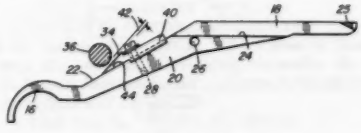
primer and is electrically insulated from said bolt carrier, and wherein said yoke is initially displaced from said magnet and is moved into alignment with said magnet upon forward movement of said bolt carrier, thereby inducing a voltage pulse in said coil by a flux change, said voltage pulse charging the capacitor with a charge sufficient to initiate said primer when said firing pin contacts said primer.

4,440,064

TIMING METHOD FOR MACHINE GUN

Miroslva J. Stehlik, Kitchener, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Feb. 16, 1982, Ser. No. 348,664
Claims priority, application Canada, Mar. 23, 1981, 373590
Int. Cl.³ F41D *11/02*
U.S. Cl. 89—136 **5 Claims**



1. A timing attachment for use in conjunction with a trigger and firing mechanism of an automatic firearm having a stationary cross piece against which said trigger abuts, said attachment, when mounted, being positioned, to enable adjustment of timing action of said mechanism and comprising a saddle section shaped to embrace a portion of the trigger adjacent said cross piece, the saddle section including slot and fastner means for adjustably securing the timing attachment to said trigger; and a ramp section connected to the saddle section, the ramp section being positioned to abut said cross piece such that adjustably positioning the saddle section on the trigger

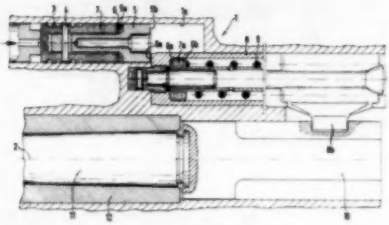
changes abutment of the ramp against the cross piece so as to cause adjustment of said timing action.

4,440,065

BREECH MECHANISM FOR AUTOMATIC FIREARMS

Gerhard Hupp, Oberndorf, Fed. Rep. of Germany, assignor to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany

Filed Dec. 15, 1981, Ser. No. 330,829
Int. Cl.³ F41D 5/04
U.S. Cl. 89—191 R **4 Claims**



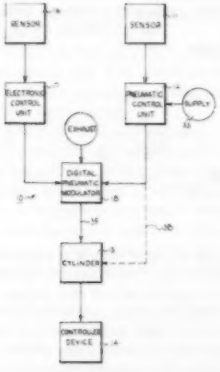
1. In a breech mechanism for automatic firearms having a high cadence, particularly a rigidly closing breech mechanism, including a gas piston effecting the opening of said mechanism; a sleeve in communication with said gas piston; a coil spring concentrically arranged in said sleeve and being stressed upon opening of said breech mechanism, and a latching and unlatching component being conducted into closing position upon release of the energy stored in said spring; the improvement comprising shock absorber means being associated with, respectively, said gas piston and with said closure coil spring, each of said shock absorber means essentially comprising a plurality of loose, stacked discs or plates of high ductility and toughness, the surfaces of said discs or plates having unevenesses formed therein which are permitted to remain unsmoothed and unfinished during the formation thereof.

4,440,066

DIGITAL PNEUMATIC MODULATOR

Terry M. Anderson, Minnetonka, Minn., assignor to The Anderson Cornelius Company, Eden Prairie, Minn.

Filed Apr. 13, 1981, Ser. No. 253,540
Int. Cl.³ F15B 13/044; G05D 23/00
U.S. Cl. 91—459 **3 Claims**



1. In a facility management system having first sensor means for sensing a preselected facility parameter and for providing a signal in response to such sensing, pneumatic control means operably connected to said sensor means for providing a pneumatic control signal in response to the signal provided by said sensor means, controlled device means for selectively affecting the prselected facility parameter, and pneumatic cylinder means operably connected to said controlled device means whereby the selective introduction and exhaust of pressurized air to and from said pneumatic cylinder means will control the extent to which said controlled device means will affect the preselected facility parameter; an improvement comprising a parallel control system that utilizes said first sensor means and said pneumatic control means as a backup system, the improvement including:

a. second sensor means for sensing the same preselected facility parameter as said first sensor means and for providing a signal in response to such sensing;

b. electronic control means operably connected to said second sensor means for electronically comparing the signal provided by said second sensor means with a predetermined signal that relates to a desired status for the sensed parameter and for providing an electronic control signal in response thereto;

c. a digital pneumatic modulator including:

i. first and second solenoid valves, each such valve having a pneumatic pathway formed completely therethrough that may be selectively blocked and unblocked by appropriate energization and de-energization of said solenoid valves, and means pneumatically connecting the first solenoid valve to the pneumatic control means to receive pressurized air therefrom;

ii. a pneumatic T intersection unit having a first and second pneumatic pathway formed therethrough, one end of said first pneumatic pathway being pneumatically connected to the pneumatic pathway of said first solenoid valve and the other end of said first pneumatic pathway being pneumatically connected to the pneumatic pathway of said second solenoid valve, the latter valve including an exhaust port, and the second pneumatic pathway being formed to have one end pneumatically intersect said first pneumatic pathway, and to have the other end serve as an output port;

iii. a flow control unit having a pneumatic pathway formed therethrough with a selectively variable obstacle disposable therein, one end of said pneumatic pathway being pneumatically connected to the output port of said second pneumatic pathway of said pneumatic T intersection unit and the other end of said pneumatic pathway being operably connectable to said pneumatic cylinder means;

wherein said first and second solenoid valves are operably connected to said electronic control means such that said solenoid valves may be selectively energized and de-energized thereby, said pneumatic cylinder means is pneumatically connected to the pneumatic pathway of said flow control unit, and a supply of pressurized air is pneumatically connected to the pneumatic pathway of said first solenoid valve; whereby said electronic control means will control said controlled device via said pneumatic cylinder means by transmitting electronic control signals to said digital pneumatic modulator which signals control the solenoid valves of said modulator to thereby selectively introduce and exhaust pressurized air to and from said pneumatic cylinder means.

4,440,067

HYDROSTATIC ACTUATOR

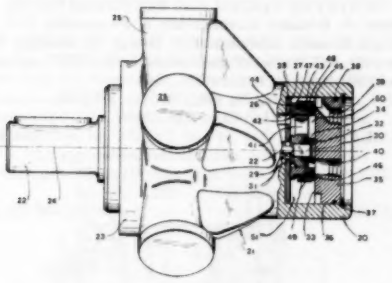
Jürgen Klie, Sprockhövel, and Hans-Wolfgang Stoll, Wetter, both of Fed. Rep. of Germany, assignors to G. Düsterloh GmbH, Sprockhoevel, Fed. Rep. of Germany

Filed Dec. 18, 1979, Ser. No. 104,906

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855566

Int. Cl.³ F01B 1/06

U.S. Cl. 91—491 14 Claims



1. A hydrostatic actuator for use with a hydraulic motor or pump having a high pressure port and a low pressure port, said actuator comprising two component parts separating a high pressure side connected to said high pressure port from a low pressure side connected to said low pressure port, said parts being movable relative to each other and defining a variable gap therebetween, hydrostatic means for adjusting the width of said gap between an open position and a sealing position in which said high pressure side is sealed off from said low pressure side, said adjusting means including a pressure space communicating with said high pressure side via a flow restrictor and with said low pressure side via a pressure limiting valve, and a piston-like member constituted by at least one of said component parts and cooperating with said pressure space to move said one component part relative to the other component part in response to the pressure in said pressure space, said hydrostatic actuator further including a stationary cylinder block with an end face in the form of a control plate provided with openings communicating via passages to respective cylinders of the block, a rotary shaft arranged in the block and passing through the control plate, an eccentric secured to the end portion of the shaft behind the control plate, said adjusting means including a housing surrounding said control plate and defining a counteracting face juxtaposed to said control plate, said two component parts being in the form of two control rings mounted on said eccentric for joint rotation therewith, said rings being telescopically arranged relative to each other and defining said pressure space therebetween, one of said rings slidably engaging on said control plate and the other control ring slidably engaging the juxtaposed face of said housing, the contact surfaces of said rings with the control plate and said housing face defining variable gaps, said high pressure side being formed in the annular space between said housing and the outer walls of said rings and said low pressure side being formed in the interior of said two control rings, said two control rings being spring biased into a gap sealing position, said one control ring being formed with a change-over valve and with a restrictor connecting said change-over valve to said pressure space and with a pair of interconnected check valves, and said pressure limiting valve being coupled between the common point of said check valves and said pressure space.

4,440,068

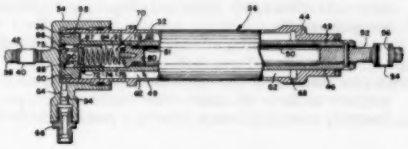
HYDRAULIC COWL DOOR ACTUATOR WITH ANTI-VIBRATION LOADING DEVICE, AND ASSEMBLY EMPLOYING SAME

James N. Tootle, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Mar. 19, 1981, Ser. No. 245,446

Int. Cl.³ F01B 11/02

U.S. Cl. 92—85 A 8 Claims



1. A single acting actuator for use in an aircraft jet engine cowl door assembly including a cowl door mounted on an engine housing for movement between opened and closed positions, said actuator comprising a cylinder containing a piston-rod assembly, respective bearing means for connecting said cylinder to one of said door and housing and said piston-rod assembly to the other of said door and housing, said piston-rod assembly being extendable under fluid pressure to open said door, spring means carried by said piston-rod assembly, and means for preloading said spring means when the fluid pressure is released from said cylinder and said piston-rod assembly is retracted, said spring means, when preloaded while said piston-rod assembly is in the retracted position as aforesaid and in the absence of fluid pressure in said cylinder, producing an actuator extend force to preload said actuator and bearings, said cylinder having an end wall, and said means for preloading said spring means including pusher means in said piston-rod assembly operative to engage said end wall as said actuator near its retracted position to preload said spring means which produces such actuator extend force, said pusher means comprising a pusher telescoped in an axial bore in said piston-rod assembly and biased towards said end wall by said spring means, said pusher engaging said end wall and being telescoped into said axial bore against said spring means to produce such actuator extend force as said actuator nears its retracted position, said piston-rod assembly including retainer means for retaining said pusher in said bore for limited telescoping movement, said retainer means having a central opening, and said pusher having a reduced diameter axial extension projecting through said opening and an enlarged diameter guide skirt portion slidably engaging the wall of said bore and engageable with said retainer means to prevent said pusher from being urged from said bore by said spring means.

4,440,069

COMPOSITE PISTON AND PROCESS

Matthew W. Holtzberg, Ringwood, N.J.; Steven J. Henke, Woodridge, Ill.; Lawrence D. Spaulding, Naperville, Ill., and James C. Oakley, Montgomery, Ill., assignors to Standard Oil Corporation (Indiana), Chicago, Ill.

Filed Jun. 11, 1982, Ser. No. 387,323

Int. Cl.³ F16J 1/01

U.S. Cl. 92—224 40 Claims

1. A composite piston, comprising:

a metal head having an annular wall defining a set of piston ring-receiving grooves, a transverse disc extending laterally between and connecting said annular wall for compressing an air fuel mixture, and a pair of legs extending longitudinally from said disc and spaced radially inwardly from said annular wall and defining a pair of diametrically opposed leg holes; and

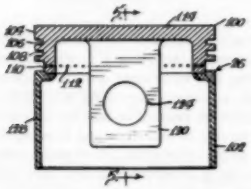
a thermoplastic, amide-imide resinous polymeric skirt having an elongated annular wall portion and a pair of bosses

extending radially inwardly from said wall portion, said wall portion positioned in general longitudinal alignment with and cooperating with said annular wall of said head to define a composite piston wall for reciprocatingly sliding against a cylinder wall, said wall portion annularly surrounding said legs, said bosses connected to said legs and defining a pair of diametrically opposed skirt holes, and said skirt holes and said leg holes being transversely aligned in registration with each other and being of a sufficient size for pivotally receiving a wrist pin; and

said amide-imide skirt and said metal head maintaining their structural relationship, shape and integrity at engine operating conditions.

27. A process for forming a composite piston, comprising the steps of:

injection molding a thermoplastic, amide-imide resinous polymer to form an amide-imide skirt having a pair of inwardly extending bosses defining a pair of skirt holes;



allowing said amide-imide resinous polymeric skirt to cool below its plastic deformation temperature;

post curing said amide-imide skirt by solid state polymerization to enhance the strength and integrity of said amide-imide skirt;

turning a metal head on a lathe to form an aanular wall defining a set of piston ring-receiving grooves and a substantially circular disc extending across said annular wall, cutting a pair of metal legs extending axially from said disc on a milling machine, and drilling a pair of aligned holes in said metal legs;

connecting said amide-imide skirt to said head by press fitting said bosses against said metal legs until said amide-imide skirt abuts against said annular wall said amide-imide skirt abuts against said annular wall of said metal head; and

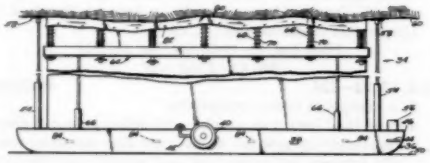
honing said holes in said amide-imide skirt and said metal legs to a sufficient size to pivotally receive a wrist pin.

4,440,070

MOBILE ADJUSTABLE CURTAIN APPARATUS FOR USE IN ROOM AND PILLAR COAL MINING VENTILATION SYSTEM

Paul V. Baker, 839 Chestnut St., Indiana, Pa. 15701, and David Vehovic, R.D. 2, Box 144D, Clymer, Pa. 15728

Filed Jan. 5, 1982, Ser. No. 337,268
Int. Cl.³ F24F 7/00
U.S. Cl. 98—50 **14 Claims**



12. A method for providing a temporary forward extension of a regular brattice in a room and pillar coal mining ventilation system, comprising:

(a) manually rolling forward of the leading edge of the regular brattice, towards the face which is being mined, a handcart having a section of brattice curtain longitudinally, vertically extending height-adjustably mounted thereon, until the cart is partially exposed;

(b) immobilizing the cart;

(c) bracing the cart against tipping over sideways, by erecting jacking posts between the cart and the mine roof; and

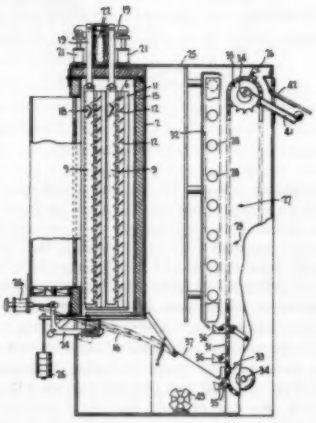
(d) raising the section of brattice curtain vertically into engagement with the mine roof, while said section of brattice curtain hangs to adjacency with the floor of the mine.

4,440,071

CONVEYOR SYSTEM FOR SKEWERED FOODS

Michael G. Boosalis, deceased, late of Fayetteville, N.C. (by Frieda Boosalis, administratrix); George M. Boosalis, Fayetteville, and Wayne Ferris, Sanford, both of N.C., assignors to Frieda Boosalis, Fayetteville, N.C.

Filed May 21, 1982, Ser. No. 380,767
Int. Cl.³ A47J 37/04
U.S. Cl. 99—339 **6 Claims**



1. Apparatus for heating and dispensing food articles supported on elongated skewers, said apparatus comprising:

conveyor means defining an elongated path of travel between skewer receiving and discharging stations, said conveyor means including a pair of endless conveyors spaced transversely from each other relative to the length dimension of said path;

driving means operatively associated with said conveyor means for moving said endless conveyor along said path;

heating means disposed adjacent said path;

a plurality of skewer support means secured on and spaced longitudinally along each endless conveyor, each skewer support means on one of said conveyors being paired and transversely aligned with a skewer support means on the other of said conveyors, each skewer support means comprising a bracket member having a closed end for loosely carrying a skewer portion while travelling along said path and an open end which is sufficiently wider than the thickness dimension of said skewer portion to freely receive said skewer portion when the skewer portion is dropped into said bracket member at said receiving station and to permit the received skewer portion to drop freely of its own weight from the bracket member at said discharging station;

wherein said bracket members are oriented on said conveyors such that said open end is directed generally upward when passing said receiving station and generally downward when passing said discharging station; and

means for continuously rotating said skewers in said bracket members as said skewers travel along said path, said means for continuously rotating comprising an elongated gear track disposed adjacent said path in direct contact with skewers location intermediate said endless conveyors;

wherein said means for continuously rotating further comprises at least two spaced roller bearings in each bracket member for rotatably supporting the skewer portion received in the bracket member, and means continuously urging said bracket members in said path toward said elongated gear track to positively engage supported skewers with said gear track.

4,440,072

APPARATUS FOR MAKING MULTI-LAYER CREAM-FILLED WAFER BLOCKS

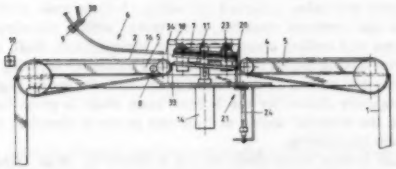
Franz Haas, Sr., Gerstlgasse 25, A-1210 Wien; Franz Haas, Jr., Castellezgasse 32, A-1020 Wien, and Johaan Haas, Wiener Strasse 209-215, A-2104 Spillern/N.Ö., all of Austria

Division of Ser. No. 274,247, Jun. 16, 1981, Pat. No. 4,391,832. This application Feb. 18, 1983, Ser. No. 467,663

Claims priority, application Austria, Jun. 18, 1980, 3219/80

Int. Cl.³ A21D *13/00*; A23G *3/00*

U.S. Cl. 99—450.4 **10 Claims**



1. An apparatus for manufacturing wafer blocks having layers of wafer sheets, the wafer sheets having upper and lower sides, the apparatus comprising:

a feeder conveyor for moving cream-coated wafer sheets in a downstream direction in a first plane;

a stacking device disposed adjacent to and generally downstream of said feeder conveyor for receiving cream-coated wafer sheets from said feeder conveyor and for stacking the wafer sheets vertically one under the other to form a wafer block, said stacking device having an upstream and downstream side;

a run-off conveyor disposed downstream of said stacking device for receiving completed wafer blocks discharged from the stacking device and for transporting such wafer blocks away from the stacking device;

said stacking device including means for: vertically lifting a cream-coated wafer sheet received from said feeder conveyor above said feeder conveyor and into a second plane which is above said first plane and for attaching the lifted cream-coated wafer sheet to the lower side of a wafer sheet in said second plane to form a wafer block which is in a raised position with respect to the feeder conveyor, said attaching being effected by the contact of the cream coating of the wafer sheet being raised with the lower side of an immediately adjoining sheet in the second plane;

means for controlling discharge of the completed waffle blocks from the stacking device;

means for separately supplying an uncoated covering wafer sheet for each wafer block by delivering the covering sheet directly into said stacking device in said second plane so that a cream-coated wafer sheet is attached to the lower slide of the covering sheet by raising of the coated sheet into a position in which its cream coating contacts the lower side of the covering sheet, said separate supplying means including a covering sheet conveyor for conveying the uncoated covering wafer sheet in a downstream direction, said covering sheet conveyor having ends, one of which is a terminal end, the terminal end being that end past which the covering sheet moves when the covering sheet has traveled along the length of the covering sheet conveyor, said covering sheet conveyor having a terminal end region adjacent said terminal end, said covering sheet conveyor being disposed above said feeder conveyor with its terminal end region ending in said second plane at said upstream side of said stacking device.

4,440,073

PRESSING PLATE FOR USE IN CHEESE MAKING

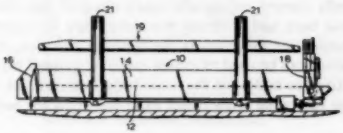
Guy Quilliou, Niort, France, assignor to Pierre Guerin S.A., Mauze-Sur-Le-Mignon, France

Filed Dec. 30, 1981, Ser. No. 335,762

Claims priority, application France, Jan. 15, 1981, 81 00610

Int. Cl.³ A01J *25/10, 25/12, 25/13*; A23C *19/00*

U.S. Cl. 99—458 **10 Claims**



1. A pressing plate for use in a cheese-making vat for draining the whey from the curds, the plate being constituted by a case having an inner surface and a series of rigid filter panels disposed to cover substantially the entire inner surface, each filter panel being constituted by a filtering surface extending substantially parallel to the inner case surface in an operating position and a plurality of ribs extending between the filtering surface and supporting the inner surface of the case, the filtering surface and the inner case surface defining therebetween a space enabling the whey to flow therethrough towards an end of the pressing plate upon application of the filtering surface of the pressing plate to the curds, and the ribs defining ports enabling the whey to flow through the space; and means for selectively maintaining the panels in the operating position and for permitting movement of the panels into an open position remote from the inner case surface.

4,440,074

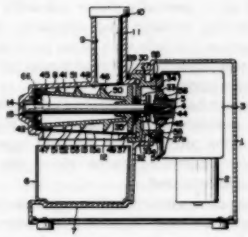
JUICE EXTRACTOR

Keisuke Ihara, Kasukabe; Shozi Hoshino, Sagamihara, and Susumu Tanioka, Yokohama, all of Japan, assignors to Tokyo Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,208

Int. Cl.³ A23N *1/02*

U.S. Cl. 99—510 **5 Claims**



1. A juice extractor comprising an elongated substantially cylindrical extractor body which is adapted to have its axis horizontal and which has a closed front end, an open rear end, an inlet port in its top near its rear end, and a juice outlet in its bottom, a cover for closing the rear end of the extractor body

having a screw-threaded connection with the extractor body and in which there is a coaxial bore, and a substantially cylindrical rotor body coaxially rotatable in the extractor body and cooperating with the latter to define an annular chamber with forwardly convergent circumferential surfaces, said rotor body having a spiral fin whereby material fed into said inlet port is driven forwardly in said chamber during rotation of the rotor body in one direction and having a coaxial shaft extending therethrough and anchored thereto, a front end portion of said shaft being receivable in a coaxial front bearing in the front end of the extractor body and a rear end portion of said shaft being axially slidable and rotatable in said bore in the cover to project rearwardly therefrom for readily detachably connection with a drive mechanism, said juice extractor being characterized by:

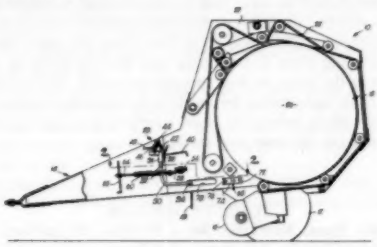
cooperating abutment means on said cover and on the rotor body, disposed eccentrically to said axis but symmetrically thereto, engageable when the shaft extends through said bore and whereby the rotor body is constrained to rotate with the cover in the opposite direction, so that the cover can be used to loosen material wedged between the extractor body and the rotor body and thus free the latter for easy axial withdrawal from the extractor body.

4,440,075

ROUND BALER HAVING WRAPPING TWINE CUTTER

Melvin V. Gaeddert, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Dec. 17, 1982, Ser. No. 450,536
Int. Cl.³ B65B *13/18*
U.S. Cl. 100—5 5 Claims



1. In a round baler having a baling chamber for spinning a cylindrical bale of material about its longitudinal axis during and after formation thereof, said chamber defined in part by a pair of spaced apart generally planar sidewalls and said axis extending generally between said sidewalls, and including means for wrapping said bale with twine prior to discharge of said bale from said chamber, improved means for applying said twine to said bale comprising:

a twine dispenser having a dispensing end shiftable between a standby position proximal one of said sidewalls and a shifted position proximal said sidewall opposite said one sidewall for dispensing twine along the longitudinal length of said bale; and

twine severing means interposed between said bale chamber and the location of said dispensing end when said dispensing end is in said standby position,

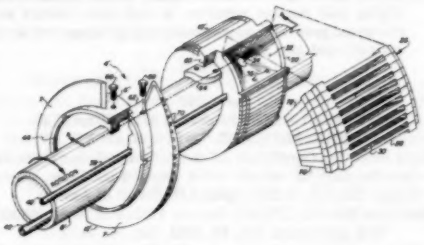
said dispensing end being disposed outwardly beyond the plane defined by said one sidewall when said dispenser is in said standby position, for drawing said twine across said severing means from the corresponding end of the bale and thereby severing said twine after said twine has been dispensed along the length of said bale.

4,440,076

SYSTEM FOR IMPROVING EFFICIENCY OF SCREW PRESSES

Pete W. Mansfield, 1861 Meadow Ct., West Palm Beach, Fla. 33406

Filed Feb. 8, 1982, Ser. No. 346,495
Int. Cl.³ B30B *9/14*
U.S. Cl. 100—117 9 Claims



1. High pressure mechanical screw press system for removal of fluids from organic materials such as sugar cane, meal, nuts, bagasse, and other materials including a hollow main shaft, at least one pressure chamber, feed worm with a plurality of worms and collars arranged on the hollow main shaft, said worms having flights thereon, securing means for securing the worms and collars on the hollow main shaft, the worm flights, rotationally driven by the hollow main shaft to press fluids from the material within at least one pressure chamber, said system comprising:

said hollow main shaft having a relatively large conduit therethrough and a relatively thin wall thickness, said hollow main shaft having a plurality of conduit means through said thin wall;

an inwardly directed means for removing at least some of the pressed fluids out of the pressure chamber;

said collars including said inwardly directed means;

said collars and said inwardly directed means aligned with said conduit means to provide direct fluid drainage into said hollow main shaft;

said collars connected directly onto and about said hollow main shaft to provide structural support for said hollow main shaft with the relative large conduit.

4,440,077

PRESS ROLLER WITH ADJUSTABLE BENDING CHARACTERISTICS

Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed May 5, 1982, Ser. No. 375,048
Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118063
Int. Cl.³ B30B *3/04*
U.S. Cl. 100—162 B 32 Claims

1. A press roller with adjustable bend characteristics, comprising:

a stationary support device;

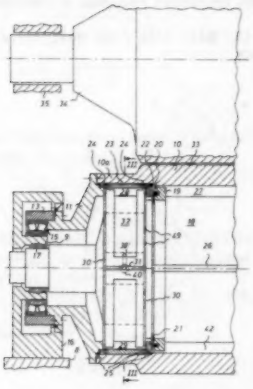
a hollow roller shell rotatable about a rotation axis about the stationary support device and being adapted to cooperate with a counter roller to define a pressure nip for a web of paper, or the like, to pass through; the nip and the shell axis lying on a pressure plane; a respective bearing at each end of the roller shell and located axially outside the nip for supporting the shell for rotation around the shell axis;

shell support means for supporting the shell on the stationary support device for transmitting supporting forces from the stationary support device to the shell for causing the shell to apply pressure to the counter roller at the nip;

a force correcting device for altering the supporting forces on the shell; the correcting device being positioned be-

tween the shell support means and at least one of the shell bearings, and that device comprising a curvedly shaped pressure chamber curving partially around the shell at the side of the shell facing toward the counter roller; means for pressurizing the pressure chamber;

axially extending, circumferentially spaced apart, axial seals defining the curved shape and circumferential limits of the pressure chamber and axially spaced apart circumferentially extending seals defining the axial limits of the pressure chamber;



a curvedly shaped seal support in the presure chamber and being spaced radially in from the shell to define the pressure chamber; the seal support supporting the circumferential seals and the axial seals of the pressure chamber thereon; means for supporting the seal support in the pressure plane, while permitting the seal support to otherwise move with respect to the stationary support device while the circumferential and the axial seals retain their seal of the pressure chamber.

4,440,078

ADJUSTABLE ELECTRICALLY CONTROLLED LIVESTOCK MARKING APPARATUS

David N. McCrery, Jr., R.R. 1, Monmouth, Ill. 61462; Harry J. Hoerner, P.O. Box 16, Good Hope, Ill. 61438, and John W. Purlee, R.R. 1, Monmouth, Ill. 61462

Filed Dec. 8, 1981, Ser. No. 328,794
Int. Cl.³ B31F *1/07*; B44B *5/00*
U.S. Cl. 101—4 **9 Claims**

1. Apparatus for marking articles comprising:

a first arm pivotally mounted for rotation about a first axis and having a marking means thereon;

a second arm pivotally mounted for rotation about a second axis for contacting said first arm and causing said first arm to pivot about said first axis;

first power means for causing rotation of said second arm about said second axis;

sensing means for detecting the presence of said article and activating said first power means in response to said presence; and

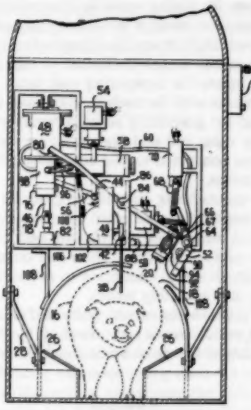
receiving means for directing one of said articles to a position such that said marking means may contact said article;

said sensing means comprising

first switch means responsive to the presence of said article;

second power means responsive to said first switch means for rotating an ink pad means from a position in contact with said marking means to a position not in contact with said marking means;

inking means responsive to the position of said ink pad means for supplying ink to said ink pad means when said ink pad means is not in contact with said marking means;



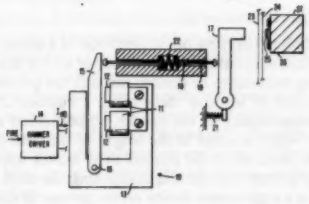
wherein said first power means is responsive to the position of said ink pad means and is activated when said ink pad means is not in contact with said marking means.

4,440,079

CONTROL SYSTEM FOR TIMING HAMMERS OF IMPACT PRINTERS

Douglas A. Dayger, Binghamton; Michael D. Hryck, Endwell; Dean W. Skinner, Binghamton, and Gerald R. Westcott, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,709
Int. Cl.³ B41J *9/00*
U.S. Cl. 101—93.03 **7 Claims**



1. A system for timing the impact of a set of hammers in an on-the-fly speed line printer with the alignment of type of a moving type carrier with said hammers, said hammers each being driven by actuating means energizable by firing pulses, said hammers having inherent flight times which may differ relative to a predetermined flight time, the combination comprising,

pulse generating means for selectively supplying initiate fire pulses at a fixed predetermined time preceding impact for selectively driving said print hammers, and

flight time control means including means responsive to said initiate fire pulses for delaying the energization of said actuating means to compensate for the difference in said inherent flight times of said print hammers including

a source of regularly recurring timing pulses,

bi-directional counter means connected to said pulse generation means and said source,

said counter means being operable in response to said initiate

fire pulses for counting said timing pulses in one direction for supplying a first count and in a second direction for supplying a second count,

register means for storing variable delay values representing a predetermined number of said timing pulses related to said inherent flight times of corresponding print hammers,

comparsion circuit means connected to said register means and said means for comparing said delay value in said register means with the timing pulse count in said counter means and for generating an equal compare signal when said delay value and said first count are equal,

switch means connected to said comparison means and said counter means,

said switch means being operable to generate a delayed fire pulse in response to said equal compare signal from said comparison means and to terminate said fire pulse in response to said second count from said counter means,

operating circuit means connected to said switch means for operating said actuating means,

said switch means being turned on by said delayed fire pulse from said switch means and turned off by the termination of said delayed fire pulse by said switch means.

4,440,080

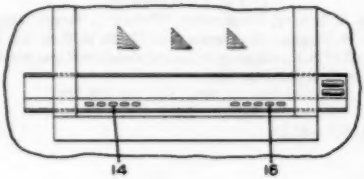
SCREEN REGISTRATION DEVICE

Joseph G. Lyall, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Dec. 21, 1981, Ser. No. 332,750

Int. Cl.³ B41M *1/12*

U.S. Cl. 101—129 **3 Claims**



2. A method of carrying out registration of a series of printing screens in a conventional flatbed printer which has a means of conveying material to be printed through the printer underneath the series of screens, there being a number of screens positioned sequentially on the printer, all positioned a set distance apart which is equal to the length of the path of movement of the material to be printed as it moves sequentially through the printer, the method comprising the steps of:

(a) placing a registration device on the printer so that it may be moved sequentially under the series of screens, the registration device having a patterned array of lights,

(b) securing a proper positioning of the registration device on the printer so that the registration device is moving in a path parallel with the axis of movement of the material being moved on the printer,

(c) moving said device through the normal sequential path of movement of the screen printer to place the registration device under a printing screen,

(d) observing the light pattern on the registration device through a pattern of openings on the screen,

(e) adjusting the screen to center the pattern of light on the registration device in the pattern of openings on the screen to secure a registration of the pattern of lights and the pattern of openings,

(f) then sequentially moving the registration device to the next screen and then adjusting the second screen to secure registration of its pattern of openings to the pattern of lights on the registration device, and

(g) continuing such movement of the registration device until it is placed in registration with all the screens of the printer.

4,440,081

DAMPENING-INKING UNIT FOR OFFSET PRINTING MACHINES

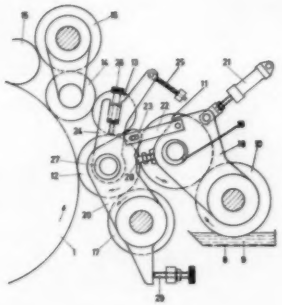
Hermann Beisel, Walldorf, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen, Heidelberg, Fed. Rep. of Germany

Filed Nov. 19, 1982, Ser. No. 442,901

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146223

Int. Cl.³ B41F *7/36, 7/40;* B41L *25/14*

U.S. Cl. 101—148 **11 Claims**



1. Dampening-inking unit for offset printing machines for forming and feeding an ink-water emulsion to a plate cylinder, comprising a first and a second distributor roller, two inking rollers disposed between said first and second distributor rollers and connected to one another by an intermediate roller, said first distributor roller being a dampening-medium distributor roller in contact with one of said two inking rollers at a given contact location, means for driving said dampening-medium distributor roller, a fountain roller dipping into a dampening-medium tank, and a metering roller engageable with the fountain roller, said metering roller being also engageable with said one of said two inking rollers at a given contact location, said contact location of said metering roller and said one inking roller being upstream of said contact location of said dampening-medium distributor roller and said one inking roller, as viewed in direction of rotation of said one inking roller, said dampening-medium distributor roller having a rough chromium outer cylindrical surface for driving said first inking roller and for intensively working-in dampening medium applied to said one inking roller into an ink film disposed therebeneath on said one inking roller.

4,440,082

ELECTROSTATICALLY ASSISTED PRINTING SYSTEM

Richard D. Carey, and Bruce E. Berlin, both of Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

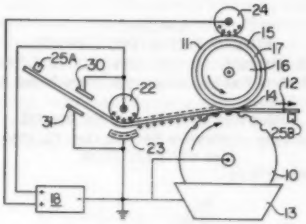
Filed Nov. 13, 1978, Ser. No. 960,141

Int. Cl.³ B41F *9/00, 13/18*

U.S. Cl. 101—170 **5 Claims**

1. In a process for printing upon a web of printable substrate wherein said web is passed between a printing cylinder and an impression roller and a high voltage electrostatic field is produced between said printing cylinder and said impression roller to assist the transfer of ink from said printing cylinder to said web, the improvement consisting of producing said high voltage electrostatic field only between said web and said printing cylinder prior to the entry of said web into the nip between said printing cylinder and said impression roller, thereby inducing said high voltage electrostatic charge only onto said web, and impressing a low voltage between said

impression roller and said printing cylinder, said low voltage ranging from about 1 to about 10 percent of said high voltage



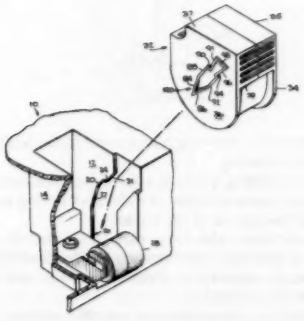
electrostatic field, thereby preventing a net buildup of spurious charges on said impression roller.

4,440,083

DISPOSABLE INKING CARTRIDGE

Clinton E. Hooper, Brookfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 17, 1983, Ser. No. 458,246
Int. Cl.³ B41F *31/00*
U.S. Cl. 101—348 **6 Claims**



1. A disposable inking cartridge in combination with said housing for transferring ink to a secondary surface, comprising:

a housing having a pair of sidewalls, each of said sidewalls having a locating guide, wherein the locating guide includes at its trailing end a leg forming an angle no greater than 90 degrees therewith;

an applicator roller rotatably mounted in said housing for transferring ink to said secondary surface; and

said disposable inking cartridge lockingly mountable in the sidewalls of said housing, said cartridge having:

a floating spindle translatable in a direction perpendicular to the locating guides in said housing sidewalls,

an inking roller rotatably mounted on said spindle and engagable with said applicator roller, and

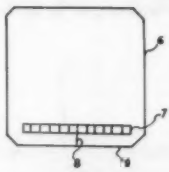
a pair of sidewalls, each of said sidewalls having a locating guide, wherein the cartridge locating guide includes at its trailing end a leg forming an angle no greater than 90 degrees therewith, and wherein the cartridge locating guide slidingly engages the housing locating guide, and means for biasing the floating spindle towards the applicator roller and for urging the legs of the cartridge guide into locking engagement with the legs of the housing guide when the cartridge is inserted into locking engagement with the housing sidewalls.

4,440,084

METHOD OF ADJUSTMENT OF PRINTING MACHINE INKING DEVICE

Boris Pozin, 35-33 83rd St., Jackson Heights, N.Y. 11510

Filed May 17, 1982, Ser. No. 379,099
Int. Cl.³ B41F *31/02*
U.S. Cl. 101—365 **4 Claims**



4. A method of adjusting of a multi-color printing machine with an ink supply gap formed between an inking roller and an inking blade and changeable at a plurality of locations by a plurality of adjusting members acting upon the inking blade at these locations, the method comprising the steps of

forming a supply gap between an inking roller and an inking blade so that the supply gap is identical at all these locations:

providing a printing plate with a prospective image to be printed;

attaching a colorless pattern of a prospective color bar on a portion of the printing plate, the portion spaced from the image;

applying ink by inking means of a printing machine successively first on the prospective image and then onto the colorless bar pattern attached to the printing plate, by displacing the printing plate relative to the inking means;

removing the thus-produced color bar from the printing plate;

measuring color densities of the color bar thus-produced on and removed from the printing plate, at a plurality of color bar locations corresponding to the locations of the adjusting members;

determining deviations of the thus-measured color densities of the color bar produced on and removed from the printing plate, from the standard values at the respective locations of the color bar; and

actuating the respective adjusting members so as to displace the inking blade at the respective locations in correspondence with the thus-determined color densities deviations of the color bar produced on and removed from the printing plate, so as to adjust the ink supply at the respective locations.

4,440,085

SAFETY APPARATUS FOR SPINNING PROJECTILE FUZES

Rudolf Rossmann, Zurich, and Paul Cahannes, Embrach, both of Switzerland, assignors to Werkeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Jun. 8, 1982, Ser. No. 386,354
Claims priority, application Switzerland, Jun. 30, 1981, 4287/81
Int. Cl.³ F42C *15/26*
U.S. Cl. 102—235 **6 Claims**

1. A safety apparatus for a spinning projectile fuze for a projectile having a lengthwise axis, comprising:

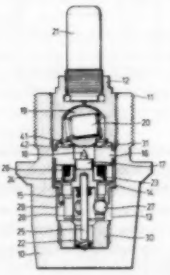
a substantially ball-shaped rotor which can rotate out of a safety position into an armed position;

a closure body member;

a support member;

said rotor being rotatably mounted between said closure body member and said support member;

a first substantially ring-shaped groove provided in said closure body member;
said first ring-shaped groove being located in a plane which is disposed essentially perpendicular to the lengthwise axis of the projectile;
a second substantially ring-shaped groove provided in said ball-shaped rotor;
said second ring-shaped groove being located, in the safety position of the rotor, in a plane which is substantially perpendicular with respect to the lengthwise axis of the projectile;

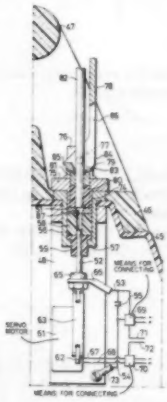


a safety spring in the form of a substantially ring-shaped disk member which protrudes both into the first ring-shaped groove and into the second ring-shaped groove for securing the rotor in its safety position;
said safety spring being deformable by the firing acceleration and by the projectile spin for releasing the rotor for movement into its armed position;
the ring-shaped disk member being subdivided by cut-outs into segments located in succession; and
the successive segments being alternately directed in a substantially wave-shaped configuration upwardly and downwardly.

4,440,086
IMPACT ARMING DEVICE FOR A FUZE
Carl R. Brotherton, Tempe, and Peter M. Rendek, Chandler, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed May 27, 1983, Ser. No. 499,007
Int. Cl.³ F42C *15/34*
U.S. Cl. 102—254 **14 Claims**

1. An impact arming device for a fuze containing a detonating train, said device comprising:
a housing;
an interrupter mounted in said housing for slideable movement between a first, unarmed, position and a second, armed, position;
said interrupter being formed to complete the detonating train in the second position and break the detonating train in the first position;
means affixed to one of said interrupter and said housing for normally maintaining said interrupter in the first position until the application of at least a predetermined amplitude of impact force thereto whereupon said interrupter is moved to the second position.

4,440,087
FIRING INITIATING DEVICE
Ingemar B. Haglund, Gyttorp, and Nils A. L. Westerlund, Fjärås, both of Sweden, assignors to Nitro Nobel Aktiebolag, Gyttorp, Sweden
Filed Oct. 29, 1981, Ser. No. 316,528
Claims priority, application Sweden, Oct. 31, 1980, 8007673
Int. Cl.³ F42C *19/08*
U.S. Cl. 102—275.11 **6 Claims**



1. A device for initiating a pressure-impulse initiatable fuse, said device including
a holder for holding a fuse in a given position, and
a pair of electrodes arranged in a chamber having an open side facing a fuse placed in the holder,
wherein said electrodes form part of an electric circuit arranged to generate a pressure impulse required for initiating said fuse, by creating an electric discharge in a spark gap between the electrodes,
and wherein said electrodes are movable relative to one another between positions in which they are located at a distance apart which is too great for a discharge therebetween to take place and positions where the distance between said electrodes is such as to permit a discharge to take place.

4,440,088
FABRIC INSERTION SYSTEM
John A. Wallace, Everett, and Bernard R. Bader, Bothell, both of Wash., assignors to Black Clawson, Inc., Everett, Wash.
Filed Oct. 11, 1979, Ser. No. 83,891
Int. Cl.³ E01B *1/00, 37/00*
U.S. Cl. 104—7 A **11 Claims**

1. A fabric insertion system for placing fabric in the rock ballast road bed of a railroad track at a predetermined depth in said ballast, comprising:
a car for supporting fabric to be inserted into the ballast, and

a fabric insertion sled secured to said car and positionable beneath said car in said ballast at said predetermined depth, said sled having a fabric inlet opening to one side thereof and a fabric outlet opening which extends across the upper surface of said sled at an angle of approximately 45° with respect to the direction of movement of said sled through said ballast, said sled receiving the fabric through said inlet opening such that said fabric emerges from said sled through said outlet opening and slides across said upper surface of said sled passing rearwardly from said outlet opening, and is positioned at said predetermined depth.

4,440,089

RAILWAY TRACK BALLAST TAMPING DEVICE

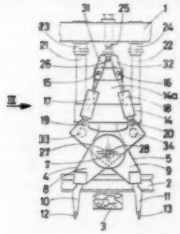
Yvo Cicin-Sain, Bussigny, and Yvan Deliyski, Lausanne, both of Switzerland, assignors to Canron Inc., Crissier, Switzerland

Filed Oct. 14, 1981, Ser. No. 311,246

Claims priority, application Switzerland, Oct. 29, 1980, 8037/80

Int. Cl.³ E01B *27/16*

U.S. Cl. 104—12 **4 Claims**



1. A railway track ballast tamping device comprising a frame structure movable on the track rails and at least one tamping unit disposed on a support mounted on said frame structure, said tamping unit comprising in turn at least one pair of opposite and jointly operating tamping tools each consisting of an arm and of at least one pick fastened thereto, a driven eccentric shaft rotatably mounted on said support and provided with at least one flywheel having an out-of-balance weight affixed thereto and at least one pair of cranks coupled to the arms of said one pair of tamping tools in order to transmit a vibratory motion thereto, said arms being connected to said support by means of coupling members pivotally connected on the one hand to pivot means carried by said support and located above the upper ends of said arms, and on the other hand to the corresponding arm, said coupling members being so oriented as to cause said arms to oscillate about their pivot region on said eccentric shaft, wherein:

said arms of said one pair of tamping tools have each substantially the configuration of a substantially rectilinear two-armed lever and cross each other in the region of said eccentric shaft,

the pivot centers between the arms and the coupling members lie on the eccentric shaft side opposite the picks, and

for balancing at least partially the dynamic forces and torques exerted on said support during the rotation of said eccentric shaft, in addition to said out-of-balance weight affixed to said flywheel other balance weights are secured to said coupling members at locations overlying the pivotal connections between said coupling members and said support.

4,440,090

STORAGE ARRANGEMENT FOR TRUCK CONVEYOR TROLLEYS

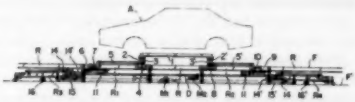
Masasumi Murai; Hirokazu Kondo, both of Tokorozawa, and Shigekatzu Takino, Hanno, all of Japan, assignors to Tsubakimoto Chain Company, Osaka, Japan

Filed Feb. 16, 1982, Ser. No. 348,777

Claims priority, application Japan, Nov. 27, 1981,

Int. Cl.³ B61B *10/00*; B65G *63/00*; E04H *6/20*

U.S. Cl. 104—127 **12 Claims**



1. A storage arrangement for conveyor trolleys, comprising:

(a) a front trolley unit;

(b) a rear trolley unit;

(c) an article carrier for receiving an article for conveyance having trolley-engagement means detachably engageable with said front and rear trolley units;

(d) a running rail means for guiding said front and rear trolley units along a selected conveyance path, said front and rear trolley units having rail-engagement means for engaging said rail means;

(e) storage rail means at a selected storage location along said conveyance path for storing said front and rear trolley units;

(f) transfer rail means at said storage location, said transfer rail means in a first position cooperating with said running rail means to enable transfer of said front and rear trolley units between said running and said transfer rail means, and in a second position cooperating with said storage rail means to enable transfer of said front and rear trolley units between said transfer and said storage rail means;

(g) transfer-rail displacement means for displacing said transfer rail means between said first and second positions; and

(h) transfer drive means at said storage location for transferring said front and rear trolley units between said storage rails and said transfer rails.

8. A storage arrangement for conveyor trolleys, comprising:

(a) a front trolley unit;

(b) a rear trolley unit;

(c) an article carrier for receiving an article for conveyance having trolley-engagement means detachably engageable with said front and rear trolley units at the respective front and rear of said article carrier;

(d) a running rail for guiding said front and rear trolley units along a selected conveyance path, said front and rear trolley units having rail-engagement means for engaging said running rail;

(e) a plurality of storage rails provided at a selected storage location along said conveyance path for storing said front and rear trolley units, each trolley-storage rail having an operative position in operable communication with said running rail to enable transfer of said front and rear trolley units between said running and storage rails, and an inoperative position out of communication with said running rail, said trolley-engagement means of said article carrier being engageable with said front and rear trolley units in said operative position and disengaged in said inoperative position to enable storage of said front and rear trolley units independently of said article carrier; and

(f) rail displacement means for displacing each of said storage rails between said operative position and inoperative positions.

4,440,091

GUIDEWAY CONTROL APPARATUS

John A. Burgess, 232 S. Chancellor St., Newtown, Pa. 18940

Filed Aug. 6, 1982, Ser. No. 405,787
Int. Cl.³ A01B 69/00; B61B 12/02; G05D 1/00
U.S. Cl. 104—139 10 Claims

1. A control apparatus for guiding a self-propelled tractor, comprising:

a longitudinal guideway positioned on the ground;

a tether cable connected to said self-propelled tractor;

means for feeding cable by gathering and paying out said tether cable, said cable feeding means being connected to said tether cable;

means for holding said cable feeding means for traveling along said guideway; and

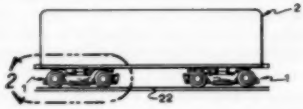
means for stopping said holding means at each end of said guideway for initiating a reversal in direction.

4,440,092

RAILWAY STEERING TRUCK LINEAR INDUCTION MOTOR ASSEMBLY

George Sobolewski, Laval West, Canada, assignor to Urban Transportation Development Corporation Ltd., Toronto, Canada

Continuation of Ser. No. 890,319, Mar. 27, 1978, abandoned. This application Jan. 28, 1981, Ser. No. 229,718
Claims priority, application Canada, Nov. 30, 1977, 292092
Int. Cl.³ B61B 13/12; B61C 5/00; H02K 41/02
U.S. Cl. 104—291 21 Claims



1. A steerable truck comprising a main frame for connection to a vehicle body, a pair of axle assemblies supporting said main frame and connected thereto at locations spaced apart along a longitudinal axis of said truck for steering movement about respective spaced generally vertical steering axes, a linear induction motor extending between said axle assemblies for cooperation with a reaction rail to propel said truck, and suspension means extending between said motor and said axle assemblies to locate vertically said motor, said suspension means comprising first link means connecting said motor to one of said axle assemblies to inhibit relative pivotal movement between said motor and said assembly about the longitudinal axis of said truck while permitting relative pivotal movement between said motor and said one axle assembly about its steering axis, and second link means connecting said motor to the other of said axle assemblies to permit relative pivotal movement therebetween about said longitudinal axis and about the steering axis of said other axle assembly, said suspension means thereby permitting steering motion and torsional flexibility between said axle assemblies while inhibiting the application of torsional loads to said motor.

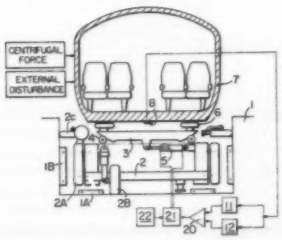
17. A steerable truck comprising a pair of wheelsets spaced apart along a longitudinal axis of said truck, a pair of yokes each associated with a respective one of said wheelsets, a main frame supported by said yokes and connected thereto to permit rotation of said yokes relative to said main frame about respective spaced vertical steering axes, a linear induction motor located beneath said yokes for cooperation with a reaction rail, suspension means to suspend said motor from said yokes to maintain said motor in a fixed vertical orientation relative to said truck, thrust means to transmit longitudinal forces from said motor to said yokes and centering means to inhibit lateral displacement of said motor relative to said yokes, said suspension means comprising three links each having universal connections at each end for connection to said motor and a respective one of said axle assemblies, two of said links being connected at spaced locations between one of said axle assemblies and said motor and the other of said links being connected between the other of said axle assemblies and said motor, said links thereby permitting steering and torsional deflection between said axle assemblies while being vertically supported thereby.

4,440,093

VEHICLE TILT CONTROL APPARATUS

Yutaka Kakehi; Katsuyuki Terada; Kenjiro Kasai, and Fumio Iwasaki, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 23, 1981, Ser. No. 276,477
Claims priority, application Japan, Jun. 23, 1980, 55-84010; Jul. 23, 1980, 55-103236[U]
Int. Cl.³ B61B 12/02; B61F 5/16, 5/24
U.S. Cl. 105—164 9 Claims



1. A vehicle tilt control apparatus provided between a car body and a truck for tiltably supporting the car body on the truck, comprising:

a fluidically operating mechanism disposed between said car body and said truck for controlling the degree of tilting of said car body relative to said truck;

an acceleration detector mounted on said car body for detecting centrifugal and vibration acceleration forces to which said car body is subjected and for producing an output indicative of the level of the forces detected;

a centrifugal force compensation circuit connected to said acceleration detector and producing a control signal for suppressing centrifugal acceleration forces acting on said car body due to the passage of the car body through a curve, in response to a centrifugal force component of the output of said acceleration detector;

a jolting compensation circuit connected to said acceleration detector and producing a control signal for suppressing vibration forces acting on the car body due to jolting of the car body, in response to a vibration component of the output of said acceleration detector;

an adder circuit means, connected to said centrifugal force compensation circuit and said jolting compensation circuit, for adding the outputs of said compensation circuits and producing an output control signal; and

a control valve arranged between said fluidically operating mechanism and a fluid source for controlling the flow of fluid between said fluid source and said fluidically operat-

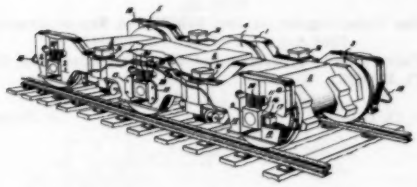
ing mechanism in direct response to the output control signal of said adder circuit.

4,440,094

FLUID SELF-STEERING RAILWAY VEHICLE TRUCK

Samuel Levy, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 125,508, Feb. 28, 1980, abandoned.
This application Jun. 18, 1982, Ser. No. 389,726
Int. Cl.³ B61C *3/00, 9/50;* **B61F** *5/38*
U.S. Cl. 105—166 **6 Claims**



1. In a railway vehicle truck having a longitudinal axis in its direction of travel and comprising a rigid truck frame, multiple wheel set assemblies including a leading wheel set assembly and a trailing wheel set assembly disposed aft of said leading wheel set assembly along said longitudinal truck axis, said wheel set assemblies each comprising an axle, a pair of flanged wheels having wheel tread conicity and mounted on said axle, and two journal boxes mounted adjacent opposite ends of said axle and operatively disposed in said truck frame so that each corresponding wheel set assembly is operatively positioned in said truck, each of said journal boxes including:

a bearing mounted about a section of said axle, said bearing supporting said axle and providing a means of rotation of said axle relative to said journal box,

longitudinal load bearing surfaces disposed in planes substantially perpendicular to said longitudinal axis, said planes being disposed forward and aft of said axle along a line parallel to said longitudinal axis, and

lateral load bearing surfaces disposed substantially orthogonal to said longitudinal load bearing surfaces, the improvement comprising:

means for repositioning said journal boxes of said leading and trailing wheel set assemblies with respect to said truck frame, said means including a plurality of fluid containing force transmitting means each positioned on said truck frame adjacent and movable relative to at least one of said longitudinal load bearing surfaces of at least one of said journal boxes of said leading and trailing wheel set assemblies, each of said force transmitting means including a rub plate portion adjacent and engageable with one of said longitudinal load bearing surfaces, with at least two of said force transmitting means defining a set; and

conduits interconnecting said force transmitting means in each of said sets in flow communication.

4,440,095

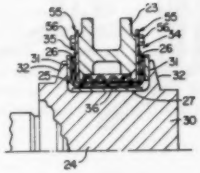
WEAR MEMBER FOR RAILWAY VEHICLE

Julien C. Mathieu, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Feb. 19, 1981, Ser. No. 235,498
Int. Cl.³ B61F *5/32;* **F16C** *27/20, 33/20, 33/28*
U.S. Cl. 105—225 **16 Claims**

1. In a wear member for a railway vehicle wherein said vehicle comprises a pair of relatively movable components and said wear member is adapted to be supported by one of said components and protects said components from wear during relative movement thereof, said wear member comprising a support adapted to be supported by said one component and a polymeric material carried by said support and having a smooth antifriction outer wear surface which is adapted to engage said other component, said polymeric material comprising an ultra high molecular weight material, the improvement in which, said support is made of a structural material of substantially uniform thickness throughout, said structural material having a plurality of corrugations comprising at least a portion thereof with each corrugation having said uniform thickness throughout substantially its entire configuration and having an end surface spaced from and coplanar with the end surfaces of the corrugations adjacent thereto, said corrugations providing structural strength for said portion, said polymeric material being supported by certain of said corrugations at just the adjacent and coplanar end surfaces thereof; said wear member further comprising an intermediate member disposed between said polymeric material and said support; a first means comprising a metal structure fixing said polymeric material to said intermediate member, said metal structure being embedded between opposed surfaces of said polymeric material which serves as a matrix for and substantially completely surrounds said metal structure, said metal structure having openings therein which receive said polymeric material therethrough to provide better embedment of said metal structure, said metal structure serving the multiple purpose of providing reinforcement for and preventing cold flow of said polymeric material; and second means fixing said intermediate member to said support.

9. In a pedestal liner for a railway vehicle wherein said vehicle comprises, pedestal trucks comprising pairs of pedestal legs, a journal box disposed between each associated pair of pedestal legs, each journal box having a vertically disposed planar guide surface and a pair of spaced vertically disposed parallel side surfaces disposed on opposite sides of said guide



surface, said pedestal liner being roughly U-shaped and comprising, a bight and a pair of parallel legs and being adapted to be disposed between an associated pedestal leg and journal box and fastened to the associated pedestal leg, a roughly U-shaped support comprising the main structural portion of said liner, said support also having a bight and a pair of parallel legs, antifriction polymeric material for said parallel legs of said liner supported by said support and adapted to engage said side surfaces, and antifriction polymeric material for said bight of said liner supported by said support and adapted to engage said guide surface, said antifriction polymeric material being ultra high molecular weight polymeric material, the improvement in which, said support is made of a structural material of substantially uniform thickness throughout, said structural material having a plurality of corrugations comprising said bight of said support with each corrugation having said uniform thickness throughout substantially its entire configuration and having an end surface spaced from and coplanar with the end surfaces of the corrugations adjacent thereto, said corrugations providing structural strength for said bight of said support, said polymeric material for said bight of said support being supported by certain of said corrugations at just the adjacent and coplanar end surfaces thereof; said wear member further comprising an intermediate member disposed between said polymeric material and said support, said intermediate member having a roughly U-shaped configuration defined by a flat planar bight and a pair of parallel legs having less extension than the parallel legs of said support, said polymeric material being a single piece of material covering all of said flat planar bight and the major area of each of said parallel legs of said intermediate

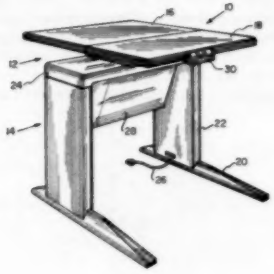
member; a first means comprising a metal structure fixed to said intermediate member, said metal structure fixing said intermediate member to said polymeric material, said metal structure being substantially equal in developed area to the developed area of said polymeric material and being embedded between opposed surfaces of said polymeric material which serves as a matrix for and substantially completely surrounds said metal structure, said metal structure having openings therein which receive said polymeric material completely therethrough to provide better embedment of said metal structure, said metal structure serving the multiple purpose of fixing said polymeric material against said intermediate member while also providing reinforcement for and preventing cold flow of said polymeric material; and second means fixing said intermediate member to said support.

4,440,096

ADJUSTABLE WORD PROCESSING TABLE AND THE LIKE

Thomas E. Rice, Cheswick, and Peter T. Young, Oakmont, both of Pa., assignors to Haskell of Pittsburgh, Inc., Verona, Pa.

Filed Dec. 15, 1981, Ser. No. 330,894
Int. Cl.³ A47F 5/12
U.S. Cl. 108—3 9 Claims



1. An adjustable split top table for accommodating word processing equipment and the like comprising:

A. a base support for resting on the floor;

B. a main frame connected to the base support, said main frame including a pair of parallel and spaced members positioned along a longitudinal central axis of the table;

C. a first lead screw operably mounted to said main frame and positioned between said members and inclined forward at an angle on the order of 25° to the vertical;

D. a second lead screw operably mounted to said main frame and between said members and parallel to said first lead screw;

E. a third lead screw pivotally mounted to said main frame and positioned between said members;

F. a traveling block movably secured to each lead screw and a pair of arms upstanding therefrom;

G. table supporting means connected to each pair of arms, said supporting means including a pair of depending legs, each leg positioned in sliding engagement within a support bracket operably connected to the main frame and spaced outward from said spaced members;

H. a front table top mounted to a front bracket, said front bracket slidably mounted on horizontal leg extensions of the depending legs interconnected with the first lead screw;

I. a rear table top mounted to said supporting means interconnected with the second and third lead screws, respectively; and

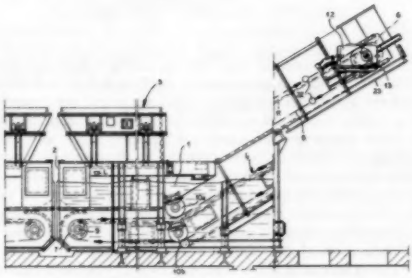
J. drive means for driving said lead screws, said means capable of driving said first lead screw to raise and lower the first table top, of driving said third lead screw to tilt said rear table top and of driving said second and third lead screws to raise and lower said rear table top.

4,440,097

ASH-REMOVAL CONVEYOR FOR A COAL-FIRED BOILER

Lothar Teske, Hegelstr. 15, 5000 Köln 90, Fed. Rep. of Germany

Filed Aug. 17, 1982, Ser. No. 409,018
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132698
Int. Cl.³ F23J 1/02; B65G 23/44
U.S. Cl. 110—167 10 Claims



1. In combination with an ash-quenching trough, an ash-removal conveyor comprising:

a drive wheel above and spaced from the trough;

horizontally spaced reversing and guide wheels in the trough below the liquid level therein;

an endless conveyor chain spanned over the wheels and having a horizontal lower stretch extending between the reversing and guide wheels, an inclined lower stretch extending between the guide and drive wheels, and an at least partially inclined upper stretch extending between the reversing and drive wheel;

drive means connected to the drive wheel for moving the chain and thereby picking ash up in the trough and conducting the picked-up ash from the trough, the drive means including

a hydraulic motor operatively connected to the drive wheel, and

pump means including a positive-displacement pump connected to the drive motor for supplying hydraulic liquid to the motor for operating same; and

means for urging the drive wheel away from the other wheels and thereby tensioning the belt, the urging means including

at least one hydraulic cylinder connected to the drive wheel and pressurizable to tension the chain,

means connecting the cylinder to the pump means for pressurization of the cylinder with substantially the same pressure in the hydraulic means,

sensor means for detecting the pressure in the cylinder and motor; and

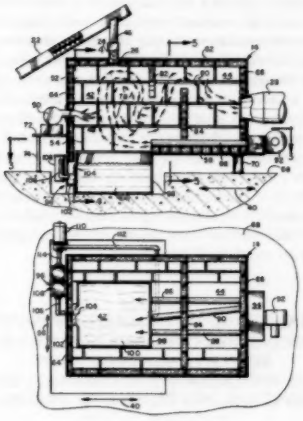
control means connected to the pump means for varying the mass flow rate of same in accordance with the detected pressure and for decreasing pump mass flow rate as detected pressure increases above a predetermined limit.

4,440,098

WASTE MATERIAL INCINERATION SYSTEM AND METHOD

Jack C. Adams, Boca Raton, Fla., assignor to Energy Recovery Group, Inc., Boca Raton, Fla.

Filed Dec. 10, 1982, Ser. No. 448,425
Int. Cl.³ F23G 5/12
U.S. Cl. 110—215 48 Claims



1. A waste material incineration system comprising:

(a) a longitudinally directed furnace having a first combustion zone and a second combustion zone, said waste material being inserted into said first combustion zone;

(b) means for helically vortexing said waste material about an axis line substantially normal said longitudinal direction within said first combustion zone, said helical vortexing means including means for inserting preheated air into said first combustion zone, said preheating air means extending adjacent said second combustion zone for discharging at least a portion of said preheated air into a lower section of said first combustion zone at an inclined angle with respect to said longitudinal direction; and,

(c) means for removing particulate material from said first combustion zone.

38. A waste material incineration system comprising:

(a) a longitudinally directed furnace having a first combustion zone and a second combustion zone, said waste material being inserted into said first combustion zone;

(b) means for helically vortexing said waste material about an axis line substantially normal said longitudinal direction within said first combustion zone, said helical vortexing means including means for including preheated air into said first combustion zone for discharging at least a portion of said preheated air into a lower section of said first combustion zone at an inclined angle with respect to said longitudinal direction, said waste material being at least partially combusted in said first combustion zone and passed to said second combustion zone; and,

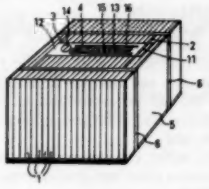
(c) scrubber means for removing contaminants and particulate material from exhaust gas products subsequent to passage of said exhaust gas products through said second combustion zone.

4,440,099

CERAMIC FIBER MODULAR ASSEMBLIES FOR LINING FURNACE WALLS

Pierre Brachet, Versailles, and Gilbert Leduc, Menaecy, both of France, assignors to La Farge Refractaires, Aristide-Briand, France

Filed May 3, 1982, Ser. No. 374,322
Claims priority, application France, Jun. 12, 1981, 81 11675
Int. Cl.³ F23M 5/00
U.S. Cl. 110—336 19 Claims



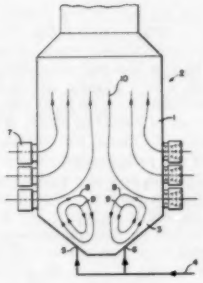
1. In a ceramic fiber modular assembly for lining walls of furnaces or other high temperature chambers, said modular assembly comprising stacked ceramic fiber strips in generally parallelepiped configuration and a refractory steel anchoring system for holding said strips and securing said modular assembly to the wall to be lined, the improvement consisting of providing an anchoring system comprising: at least two lateral members engaged in a face of said modular assembly, each of said lateral members defining a plate oriented parallel to said fiber strips and including perpendicular protrusions attached to the interior of said modular assembly by perpendicularly projecting into said strips adjacent said lateral members; a central member disposed perpendicular to said lateral members and attached therewith, said central member also defining a plate bearing flatwise against said one face of said modular assembly having an aperture for securement to the wall to be lined wherein said protrusions project parallel to said central member.

4,440,100

METHOD OF INTRODUCING ADDITIVE INTO A REACTION GAS FLOW

Sigfrid Michelfelder, and M. Yaqub Chughtai, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,377
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128903
Int. Cl.³ F23B 7/00; F23J 11/00
U.S. Cl. 110—343 8 Claims



1. A method for removing environmentally harmful gaseous material in the form of sulfur, chlorine and fluorine compounds contained in a hot reaction gas flow in the combustion chamber

of a steam generator, wherein the combustion chamber has a side wall area in which a plurality of fuel inlets are positioned and a funnel-shaped portion which converges for dry ash removal, and wherein the combustion chamber further includes at least one inlet through the funnel-shaped portion which inlet is adjacent to a closed recirculation flow within the funnel portion, the method comprising the steps of:

during burning in the combustion chamber, introducing through the inlet a pulverous additive selected from the group consisting of calcium carbonate, magnesium carbonate, dolomite and reactive metal oxide and metal hydroxide compounds;

entraining the additive in the recirculation flow to intermix with and contact fuel burning in the combustion chamber to thereby interact with the burning fuel and combine sulfur, chlorine and fluorine compounds in the burning fuel with the pulverous additive to thereby remove the sulfur, chlorine and fluorine compounds from the burning fuel as ash, and

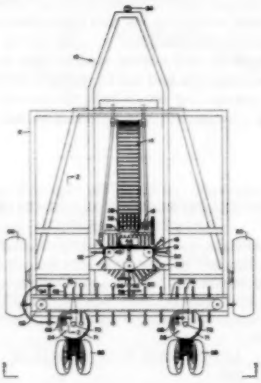
removing the sulfur, chlorine and fluorine compounds from the combustion chamber in solid form upon removing the ash therefrom.

4,440,101

PLANT TRANSFER MECHANISM

Bryant Edwards, Clarendon Hills; Stanley R. Krogman, Bartlett, and Edward J. McArdle, Morton Grove, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 104,940, Dec. 18, 1979, abandoned.
This application Sep. 3, 1981, Ser. No. 298,859
Int. Cl.³ A01C *11/00*
U.S. Cl. 111—2 **2 Claims**



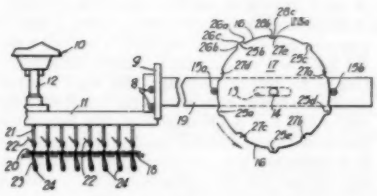
2. An apparatus for transferring plants along a predetermined path from an array of such plants arranged in ranks and rows to predetermined locations spaced from said array, means for moving said array so that each successive rank of individual plants is adjacent a first transfer station in said apparatus, means at said first transfer station to, at least partially, separate each successive rank of individual plants, as a group, from said array, a first conveyor means for moving individual plants along a portion of said path, the first conveyor means including a plurality of individual, spaced grasping means having grasping extremities thereon, the first conveyor means further being configured and located to include a first predetermined segment thereof as part of the first transfer station which segment is generally parallel to each successive rank of individual plants in the array, the spacing between the grasping extremities of adjacent grasping means in said predetermined segment being generally equal to the centerline spacing between adjacent individual plants in ranks in the array, a second transfer station including part of said first conveyor means and part of a first predetermined segment of a second, adjacent, conveyor means, the second transfer station including means including a curved path region on the first conveyor means to change the spacing between individual plants from the spacing between rows to a greater spacing, the second conveyor means including a plurality of individual spaced grasping means spaced a greater distance from one another than the spacing of the grasping means on the first segment of the first conveyor and means to release the individual plants from successive grasping extremities of the second conveyor means at a predetermined location relative to the apparatus wherein each individual plants is positively retained and controlled throughout the transfer process to insure reliable transfer from the array to the setting of each plant in a predetermined location, wherein the grasping means are spring biased clips with upper and lower jaw sections adapted to resiliently grip the plants, the means to release the individual plants including a cam means adjacent the path of the second conveyor and adapted to engage a lever associated with one of said jaw sections to move the jaw sections apart, thus releasing the plant carried thereby, including a further cam means adjacent the path of the second conveyor at a position prior to that of the first mentioned cam means, said further cam means being rotatably driven at the speed of the second conveyor and including a notch in the periphery of the cam means permitting alternating successive grasping means to move past said further cam means for releasing association with said first mentioned cam means.

4,440,102

TUFTING MACHINE AND METHOD OF TUFTING FOR PRODUCING MULTIPLE ROWS OF TUFTS WITH SINGLE LENGTHS OF YARN

Roy T. Card, 4012 Creekwood Ter., Chattanooga, Tenn. 37421, and Joseph L. Card, 1515 Edgewood Cir., Chattanooga, Tenn. 37405

Filed May 19, 1983, Ser. No. 496,010
Int. Cl.³ D05C *15/30*
U.S. Cl. 112—266.2 **12 Claims**



4. Method of producing a tufted product wherein a needle bar, carrying a plurality of spaced parallel needles, is reciprocated toward and away from a plurality of loopers corresponding in number to the number of needles, yarns are respectively supplied to the needles, a backing material is pased between said needle bar and the loopers so that loops of yarn are inserted through the backing material and are respectively caught, held and subsequently released, the needles being withdrawn from the backing material when the needle bar is moved away from the loopers, the improvement comprising:

(a) shifting the needle bar laterally in one direction during a cycle of the needles while the needles are retracted from the backing material;

(b) inserting the needles through the backing material while the needle bar is in its shifted condition;

(c) shifting the needle bar laterally in an opposite direction after the needles have penetrated the backing material and prior to the time the loopers engage the loops formed in the penetrated portions of the backing material for laterally shifting the increment of the backing material which has been penetrated as the needles are moved laterally, whereby tufts are created in the backing material laterally

of the loopers when the needles are withdrawn from the penetrated portions of the backing material.

7. A tufting machine having a reciprocating needle bar, a plurality of spaced parallel needles carried by the needle bar for reciprocation by the needle bar in a linear path of travel toward and away from loopers respectively associated with and individual to the needles and wherein backing material is passed between the needles and the loopers so that successive lengths of yarn carried by the respective needles are inserted from one side through successive transverse increments of the backing material to form tufts protruding from the other side of the backing material and wherein the loops when inserted by the needles are respectively caught and held and subsequently released by the loopers, the needles being withdrawn from the backing material as they are moved by the needle bar away from the loopers, the improvement comprising:

(a) means for shifting the needle bar laterally in one direction out of their normal path of travel while the needles are withdrawn from the backing material; and

(b) means for moving the needle bar in an opposite direction to said one direction, after the needles have penetrated the backing material and prior to the time the loopers engage and hold the yarns, whereby the needles move the increment of backing material, through which the needles project laterally and the needles release this increment of backing material when the needles are withdrawn therefrom.

4,440,103

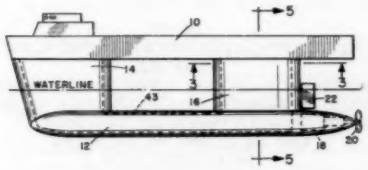
SEMI-SUBMERGED SHIP CONSTRUCTION

Thomas G. Lang, 417 Loma Larga Dr., Solana Beach, Calif. 92075

Continuation of Ser. No. 73,183, Sep. 7, 1979, abandoned. This application Aug. 14, 1981, Ser. No. 293,083

Int. Cl.³ B63B *25/00*

U.S. Cl. 114—61 **24 Claims**



1. A semi-submerged ship, comprising:

a superstructure;

a pair of longitudinally extending streamlined submersible hulls;

a plurality of submersible struts each having a lower end connected to and extending upwardly from a corresponding one of the hulls, the struts being streamlined in longitudinal cross section to minimize hydrodynamic drag and including a front strut and a rear strut longitudinally spaced on each hull;

means for defining a vertical cargo passage which extends substantially unobstructed through each strut;

means for defining a horizontal cargo passage which extends substantially unobstructed through each hull, the horizontal cargo passage extending between and connecting the vertical cargo passages in the struts connected to the hull in a continuous path;

first joint means for connecting the lower end of each strut to a corresponding one of the hulls to permit cargo to be moved between the vertical and horizontal cargo passages therein;

second joint means for connecting the upper end of each strut to the superstructure so that the hulls are transversely spaced apart and transverse loads on the struts are resisted without any connecting members extending transversely between the hulls while permitting the passage of cargo through the struts;

at least portions of the struts and hulls having a double walled construction, with load bearing structure contained between the walls to minimize obstruction of the cargo passages; and

the hulls and struts having displacement buoyancy such that when the ship is in the water the hulls will be submerged and the superstructure will be above the water.

4,440,104

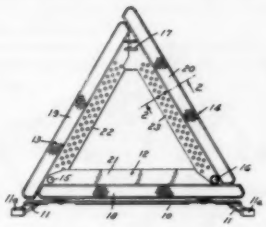
EMERGENCY WARNING DEVICE

Arthur F. Bleiweiss, Toronto, and Terence E. Base, London, both of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada

Filed Mar. 11, 1981, Ser. No. 242,629

Int. Cl.³ G08B *5/00*

U.S. Cl. 116—63 T **2 Claims**



1. An emergency warning device comprising

a base,

three arms extending upwardly from the base to define a triangle,

one of said arms extending horizontally on said base and said other two arms extending upwardly and inwardly,

each arm having passive signal means on at least one surface thereof,

at least a portion of one of said arms comprising spaced walls,

each said wall having at least one opening therethrough,

the opening in one wall being staggered with respect to the opening in the other wall such that portions of one wall overlie the opening in the other wall and such that air striking the device flows in a sinuous path through the device reducing the drag on the device,

each opening comprising a slot extending along the length of said one arm,

said slots being formed in said upwardly extending arms,

each of said slots extending along the length of said arm, the slots and the space between the spaced walls forming an air flow passage that is sinuous in cross section,

one said slot including a concave forwardly facing surface and the other said slot including a concave rearwardly facing surface such that air first strikes a forwardly facing concave surface and then a rearwardly facing concave surface such that the direction of the air is changed twice before it passes through the slots.

4,440,105

PAPER COATING APPARATUS HAVING A REPLACEABLE ORIFICE PLATE

Paul A. Jeltema, Wisconsin Rapids, Wis., assignor to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

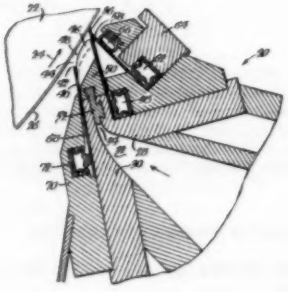
Filed Jan. 17, 1983, Ser. No. 458,437

Int. Cl.³ B05C *3/18*

U.S. Cl. 118—410 **6 Claims**

1. An improved applicator for applying a coating liquid to a moving web of paper carried through an application zone, wherein said applicator is of the type comprising a body por-

tion defining a chamber therein having an elongate opening thereto extending substantially across and parallel to the web, said chamber for receiving coating liquid and directing the same through said opening into an application zone and onto the web; a doctor blade extending from a rear side of said chamber opening substantially across and against the web for metering and leveling coating liquid on the web; an orifice plate extending from a front side of said chamber opening substantially across and toward but spaced from the web to define a gap between an upper edge thereof and the web; seal means at each opposite side end of said doctor blade and orifice plate for sealing the end spaces therebetween, said application zone being defined between said doctor blade, orifice plate and seal means; and means for introducing a copious excess of coating liquid under pressure through said opening and into said application zone to completely fill said zone with coating liquid and to continuously flow coating liquid through said gap to substantially completely and continuously fill said gap with coating liquid to form a liquid seal therein for sealing off the front edge of said application zone, wherein the spacing of said



orifice plate upper edge from the web may be controlled to adjust the size of said gap to a selected value, the improvement comprising means for mounting said orifice plate on said applicator for replacement thereof without disassembly of said applicator, said orifice plate being relatively thin and planar, having a length to extend substantially across the web and a selected height between said upper and a lower edge thereof, said mounting means ihcluding a front wall on said body portion extending substantially across the web, said front wall having a slot or channel therein extending substantially across the opening toward the web, said orifice plate being transversely extendable into and along said slot from a side end thereof to extend said upper edge thereof out of said slot and toward but spaced from the web to define said gap therewith, and means for releasably securing said orifice plate in said slot, so that to adjust the size of said gap one orifice plate of a first height in said slot may be removed therefrom and another orifice plate of a second and different height may be extended into and releasably secured in said slot, whereby said mounting means permits mounting of orifice blades of selected heights on said applicator to control the size of said gap.

4,440,106

MAGNETIC ORIENTATION SYSTEM

Joachim Greiner, Ebenhausen, and Eberhard Gärtner, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1982, Ser. No. 386,400

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1981, 3123746

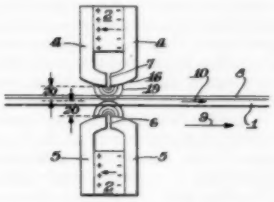
Int. Cl.³ H01F *13/00*

U.S. Cl. 118—640 **8 Claims**

1. In a magnetic system for the orientation of the magnetic primary axes of pigment particles in a magnetic, binder-containing dispersion applied to a substrate in the direction of tape travel by casting machines, comprising permanent magnets and low-retentivity elements for conducting the magnetic flux with two permanent magnets which are arranged in mirror image fashion relative to the direction of tape travel,

the novel combination comprises

two partial systems wherein the field of the first orientation system having a magnetic slit in the vicinity of the cast dispersion has an intensity between 1600 and 16,000 A/cm and is concentrated over a maximum cross-section of 5×5 mm^2, wherein the field lines have a markedly curved configuration and a strong field gradient, and



means of said first system producing a main direction of the magnetization vectors of the particles which is oriented obliquely to the direction of tape travel,

and the field of the following second partial system has an intensity between 400 and 2400 A/cm and a size of at least 0.5 cm in the longitudinal direction and essentially one longitudinal component which is oriented parallel to the direction of film travel, and the magnets which are arranged in mirror image fashion to the direction of tape travel are so constructed and arranged as to leave a distance of at least 3 mm between the slits and the substrate with dispersion.

4,440,107

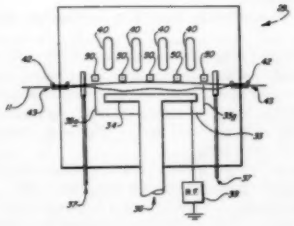
MAGNETIC APPARATUS FOR REDUCING SUBSTRATE WARPAGE

Joachim Doehler, Union Lake; Vincent Cannella, Detroit, both of Mich., and Richard O. Gray, Jr., Glen Ellyn, Ill., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jul. 12, 1982, Ser. No. 397,190

Int. Cl.³ C23C *13/10*

U.S. Cl. 118—718 **9 Claims**



1. Apparatus for producing improved semiconductor devices by substantially reducing warpage of a relatively wide, elongated, relatively thin web of electrically conductive, magnetically attractable substrate material adapted to follow a normal elongaed path of travel through at least one isolated deposition chamber wherein a semiconductor alloy layer is deposited onto one surface of the substrate; the apparatus including, in combination:

a plurality of spaced magnets operatively disposed within the at least one deposition chamber for flattening the

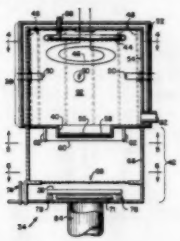
magnetically attractable web of substrate material, the magnets extending transversely across substantially the entire unlayered surface of the web to thereby create an attractive force which urges the web out of its normal path of travel and into a substantially planar path of travel through said at least one deposition chamber, whereby warpage of the web of substrate material is substantially reduced so that a uniform semiconductor alloy layer may be deposited onto the one surface of the web.

4,440,108

ION BEAM COATING APPARATUS

Roger G. Little, Bedford, Mass., and Stanley R. Shanfield, West Newton, Mass., assignors to Spire Corporation, Bedford, Mass.

Filed Sep. 24, 1982, Ser. No. 423,454
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—719 **14 Claims**



1. Apparatus for coating parts by means of a plasma supported ion beam comprising:

(a) a plasma source chamber provided with an anode and having rf means for exiting a plasma therein, a gas feed ring at one end and a neck portion at the other end thereof;

(b) a coating chamber mounted adjacent and contiguous with said plasma source chamber via said neck portion;

(c) a plurality of permanent magnets and a plurality of electron supply filaments both arranged circumferentially about said source chamber, with adjacent magnets of said plurality of permanent magnets having opposed polarity, the relative positions of said anode, said electron supply filaments and said magnets being such that the permanent magnets will be capable of increasing the path lengths of electrons between said filaments and said anode;

(d) vacuum pump means operatively connected to both said chambers; and

(e) a vacuum interlock provided in said coating chamber so as to admit said parts to be coated into said coating chamber.

4,440,109

METHOD AND APPARATUS FOR REARING POST-LARVAE SHRIMP

Charles Dugan, Goulds, and Timothy Dugan, Homestead, both of Fla., assignors to Farm Fresh Shrimp Corporation, Fort Lauderdale, Fla.

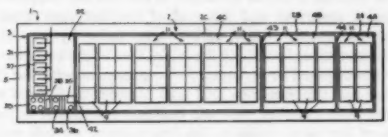
Division of Ser. No. 952,664, Oct. 19, 1978, Pat. No. 4,285,298. This application May 14, 1981, Ser. No. 263,499
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—2 **5 Claims**

1. A particulate filter for filtering the particulate matter contained in a medium of a rearing means for rearing post-larvae shrimp comprising:

a rotatably mounted hollow body having a pair of end walls which are impermeable to said medium and sidewalls which are substantially permeable to said medium and substantially impermeable to said particulate matter, whereby particulate matter is collected on the inner surfaces of said sidewalls when said medium is passed therethrough;

means for introducing said medium into said body;

means disposed within said body at a level above the level at which said medium is introduced for receiving particulate matter dislodged from said sidewalls and for carrying said received particulate matter out of said body;



means for directing fluid at the outer surfaces of said sidewalls which are at a level above the level of said means for receiving dislodged particulate matter from said sidewalls;

means for rotating said body;

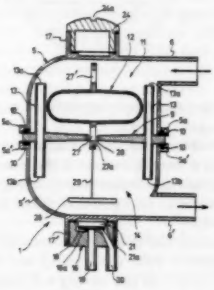
and means responsive to the medium level in said body for actuating said means for directing fluid and said means for rotating.

4,440,110

FLUID FLOW SENSOR AND CONTROL DEVICES AND APPARATUS

Mervyn L. Hicks, Eltham, New Zealand, assignor to Turn-Styles Limited, Mangatoki, New Zealand

Filed Feb. 24, 1982, Ser. No. 351,955
Claims priority, application Australia, Oct. 9, 1981, 76219/81
Int. Cl.³ A01J *7/00*
U.S. Cl. 119—14.08 **27 Claims**



1. A milk flow sensor and control device constructed and arranged for use in dairy equipment for sensing the flow of milk from an animal and controlling the actuation of fluid pressure/vacuum operated teat cup support and retraction apparatus and removing and retracting the teat cups from the animal on cessation or substantial reduction of milk flow from the animal; said sensor and control device comprising a hollow body defining a float chamber and containing a float member and defining a separated outlet area, a milk inlet to the float chamber at the upper part of the body, at least one main milk outlet from the float chamber opening to an upper part thereof separate from said inlet and communicating with the outlet area, a minor or bleed outlet at or near the base of the float chamber for drainage of milk from the float chamber, said body also defining or being provided with a secondary chamber or duct sealed from the float chamber and outlet area and having a first port and a second port for the passage of fluid under pressure or vacuum and independent of milk passing into or out of the float chamber and outlet area, there being a valve means within the secondary chamber or duct and normally

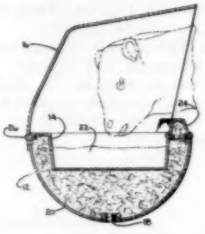
biassed to a first position but being movable against said bias to a second position, one of said first and second positions being a closed position preventing communication between the first and second ports of the secondary chamber or duct and the other of said first and second positions being an open position permitting communication between said secondary chamber first and second ports for the passage of said fluid under pressure or vacuum to effect actuation of the teat cup support and retraction apparatus and removal of the teat cups from an aminal; movement of said valve means being by way of an actuating member located in the outlet area of the body having a portion engaged or arranged for engagement with the float member and movement by said float member on flow of milk into the float chamber, and said bias being sufficient to cause return of the valve means to the first position on milk within the float chamber reaching a prescribed level.

4,440,111

MINERAL SUPPLEMENT DISTRIBUTOR

Donald A. Meyer, Dorchester, Wis., assignor to Meyer's Manufacturing Corp., Dorchester, Wis.

Filed Dec. 9, 1982, Ser. No. 448,392
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—61 **3 Claims**



1. A distributor for supplying mineral supplements to livestock comprising:

a hemispherical base suitable for resting on the ground, said base having a weight, at least in the lower portion thereof, for biasing said distributor into an upright position and for restoring same to said position when said distributor has been tipped;

a pan attached to and extending across the upper portion of the hemispheric base terminating and closing the upper portion thereof, said pan having a depression in the central portion thereof extending into the hemispherical base for receiving the mineral supplement;

a hood affixed to said base and extending over said pan for protecting the contents of same, said hood having an opening through which the head of livestock may extend to gain access to the mineral supplement in the pan, said hood lying continuously on the base along a portion of the perimeter of the hemispherical base; and

said base including a lip extending above said pan and hemispherical base along the remaining portion of the perimeter of said hemispherical base for retaining the mineral supplement in the distributor when the distributor is tipped.

4,440,112

FREEZE-PROOF LIVESTOCK WATERING DEVICE AND METHOD

J. R. Lilyerd, Rte. #4, Mora, Minn. 55051

Filed May 10, 1982, Ser. No. 376,422
Int. Cl.³ A01K *7/04*
U.S. Cl. 119—73 **11 Claims**

1. A freeze-proof livestock watering device comprising,

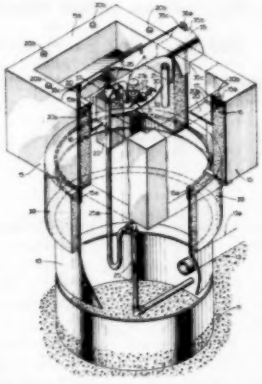
a. a reservoir pan having an open top, insulated side walls and a heat conductive bottom panel,

b. means supporting the pan in operative position above the ground surface and affording communication between the heat conductive pan bottom and above-freezing ground temperatures,

c. a water supply conduit extending into the pan reservoir,

d. a float valve connected to said conduit and mounted in said pan reservoir to prevent the water within the pan from falling below a predetermined minimum level,

e. turbulence-producing means for agitating the water in said reservoir for preventing freezing thereof,



f. an upstanding hollow stand pipe member extending upwardly through the bottom of the pan and affording communication between above-freezing ground temperatures below the pan bottom and the upper end of the stand pipe, the upper end of said stand pipe forming an overflow drain positioned to prevent the water in the pan from rising above a predetermined maximum level above the minimum level maintained by the float valve, and

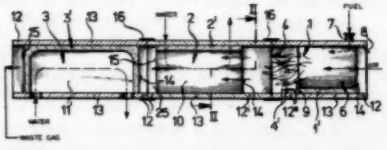
g. a protective hollow hood member for enclosing the float and the upper end of said drain stand pipe whereby the above-freezing air in the drain stand pipe is confined within the area surrounding said float to prevent freezing thereof.

4,440,113

CONNECTING SYSTEM FOR CERAMIC COMPONENTS OF A BURNER AND/OR HEATING DEVICE

Siegfried Förster, Alsdorf; Stefan R. Schindler, and Hans-Jürgen Pohlmann, both of Selb, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich and Rosenthal Technik AG, Selb, both of, Fed. Rep. of Germany

Filed Dec. 22, 1981, Ser. No. 333,259
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049163
Int. Cl.³ F22B *5/00*
U.S. Cl. 122—16 **5 Claims**



1. A burner and heating device which comprises:

a burner component including a first ceramic body formed with passages for a fuel and combustion air whereby said

fuel and combustion air is mixed at an end of said body to form a combustible mixture which is burned to form hot combustion gas, and ceramic walls, surrounding said body and forming a duct-like extension of said burner component projecting beyond said end of said body;

a recuperator component including a second ceramic body formed at the respective passages for said combustion gas and a medium to be heated, and with walls defining a duct-like extension of said recuperator component projecting beyond said second body, said duct-like extensions being aligned; and

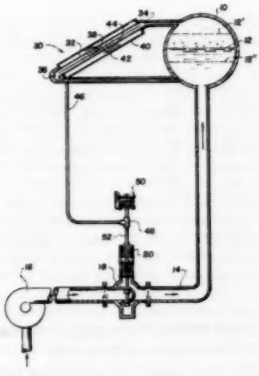
means for securing said duct-like extensions together.

4,440,114

BIAS BELLOWS FOR THERMOHYDRAULIC FEEDWATER REGULATOR

Douglas J. Tuttle, Marblehead, Mass., assignor to Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 18, 1983, Ser. No. 485,772
Int. Cl.³ F22D 5/26
U.S. Cl. 122—451.2 **14 Claims**



1. A water level regulator for a steam drum having a steam space, a water space, a feed water line and a feed water regulating valve in the feed water line with a movable control element, comprising:

an inclined inner tube having an upper end adapted for connection to the steam space and a lower end adapted for connection to the water space;

an inclined outer tube connected around said inner tube and defining a control space therewith extending across upper and lower limits of water level in the steam drum, said control space adapted to receive a volume of fluid which is pressurizable upon an increase of water level in the drum;

a connecting tube connected to said control space adapted to connect said control space to the regulating valve control element for passing fluid to move the control element;

a bias bellows defining a variable space connected to said connecting tube; and

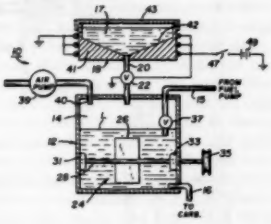
biasing means connected to said bias bellows for changing the volume of said variable space to change an overall setting relationship between the regulating valve control element and the steam drum water level.

4,440,115

FUEL TREATING APPARATUS FOR INTERNAL COMBUSTION ENGINES AND METHOD OF OPERATING SAME

James O. Allen, 1600 W. 7th St., Peoria, Ill. 61605

Filed Dec. 27, 1981, Ser. No. 334,315
Int. Cl.³ F02B 75/12
U.S. Cl. 123—1 A **8 Claims**



1. Apparatus for treating fuel continuously being supplied to an internal combustion engine, having a fuel line through which fuel is pumped, comprising; reservoir means for storing a quantity of a liquid fuel additive, said reservoir means having an outlet; mixing means having an additive inlet and a mixing chamber connected in fluid communication with the engine fuel line, said additive inlet communicating with said mixing chamber and communicating with the reservoir outlet; agitating means mounted in said mixing chamber for dispersing small quantities of additive supplied from said reservoir means through said additive inlet with fuel flowing under pressure from the fuel line through said mixing chamber to form a fuel mixture for use in the engine; means connected in fluid communication between said reservoir outlet and said additive inlet for conveying said fuel additive to said mixing chamber; outlet means connected in fluid communication with said mixing chamber for supplying continuously said fuel mixture to the engine; wherein said mixing means includes a pressurizing fluid inlet, further including fluid pumping means for supplying fluid under pressure to said fluid inlet in sufficient quantity to force said fuel mixture from said mixing chamber to said outlet means; further including said additive stored in said reservoir means, said additive being a combustible oil or grease, which is added to fuel, flowing through said mixing chamber, in a minor proportion of the weight of said fuel; further including means mounted on said reservoir means for heating said additive in said reservoir means to maintain said additive in a flowable state; and wherein said additive conveying means includes valve means connected in fluid communication between said reservoir outlet and said additive inlet for controlling the flow of said additive from said reservoir means to said mixing means.

4,440,116

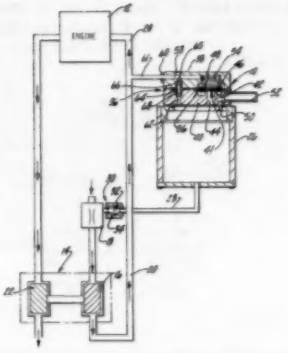
COOLANT INJECTOR

David L. Stevenson, Corunna, and Frank M. Seleno, Haslett, both of Mich., assignors to Schmelzer Corporation, Flint, Mich.

Filed Jul. 12, 1982, Ser. No. 397,558
Int. Cl.³ F02M 25/02
U.S. Cl. 123—25 J **8 Claims**

1. Apparatus for injecting coolant in the fuel-air mixture supplied to a compressor of a turbocharged engine comprising: a reservoir for storing liquid coolant, passage means connecting said reservoir to the outlet side of a turbocharger compressor, valve means in said passage means operable in response to a positive pressure at the outlet side of said compressor to pressurize said reservoir for propelling liquid coolant therefrom, a delivery passage between said reservoir and the outlet side of said compressor to deliver liquid coolant from said reservoir, and control means responsive to a predetermined

level of pressure at said outlet side of said compressor to place said reservoir in liquid communication with said inlet side of said compressor and responsive to a pressure below said predetermined pressure to relieve pressure in said reservoir and interrupt delivery of coolant from said reservoir to said inlet side of said compressor.



4,440,117

ENGINE BLOCK FOR A WATER-COOLED INTERNAL COMBUSTION ENGINE

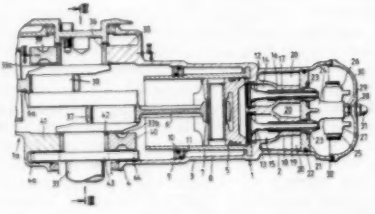
Günter Buchmüller, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,552

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115671

Int. Cl.³ F01P 3/02

U.S. Cl. 123—41.72 **9 Claims**



1. In a water-cooled internal combustion engine including a single-piece, die-cast engine block encompassing a cylinder head, a cylinder block and one part of a crankcase and means defining coolant passages in said cylinder head and said cylinder block, the improvement wherein said coolant passages are constituted by spaces open outwardly toward respective adjacent ends of the said engine block as cast, further comprising closure means fitted in said engine block for sealing said coolant passages fluidtight towards the outside.

4,440,118

OIL COOLED INTERNAL COMBUSTION ENGINE

John H. Stang, Columbus, Ind., and Steven M. Cusick, Pittsburgh, Pa., assignors to Cummins Engine Company, Inc., Columbus, Ind.

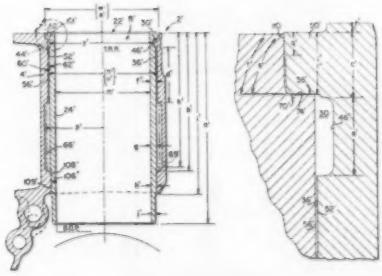
Continuation-in-part of Ser. No. 149,332, May 13, 1980, Pat. No. 4,413,597. This application Apr. 7, 1981, Ser. No. 251,932

Int. Cl.³ F02F 1/16

U.S. Cl. 123—41.84 **7 Claims**

1. An oil cooled cylinder liner for use in an internal combustion engine containing a cylinder bore extending inwardly from a surface for engaging an engine head toward a crankshaft to which is connected a piston for reciprocating travel within the cylinder bore and having a radially oriented liner support surface positioned inwardly from the head engaging surface and further having a lubrication oil circuit including an oil inlet for supplying oil to an exterior surface of the cylinder liner at a point axially adjacent the head engaging surface and still further having a cylindrical outside flow control surface formed on the interior of the cylinder bore having a fixed radius starting adjacent the oil inlet and extending inwardly, said cylinder liner comprising:

(a) a generally hollow cylindrical body having an interior cylindrical surface for guiding the piston during reciprocating movement and having an exterior surface one portion of which includes an oil flow passage forming means for cooperating with the outside flow control surface when the cylinder liner is mounted within the cylinder bore for forming a circumferential flow passage through which a very thin film of lubrication oil of uniform radial thickness may pass under laminar flow conditions having no circumferential component and having a linear component in a direction parallel to the central axis of said hollow cylindrical body and extending inwardly from the oil inlet when the liner is mounted within the cylinder bore, said oil flow passage forming means including an inside flow control surface having a fixed radius along its entire



length which is 0.006 to 0.016 inches less than the radius of the outside flow control surface; and

(b) liner positioning means for positioning said inside flow control surface concentrically within the outside flow control surface when said hollow cylindrical body is positioned within the cylinder bore to form the oil flow passage between said inside flow control surface and the outside flow control surface with a constant radial dimension between 0.006 and 0.016 inches throughout the axial and circumferential extent of the oil flow passage, said liner positioning means including:

(1) outer locating means adjacent the outer end of said hollow cylindrical body for forming a precise radial fit with the outermost portion of the cylinder bore, said outer locating means including a radial flange positioned outwardly from said inside flow control surface,

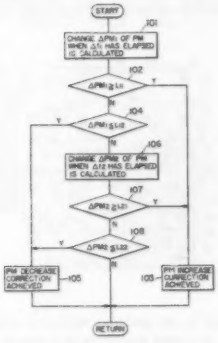
(2) inner locating means positioned inwardly from said inside flow control surface for forming a precise radial fit with a corresponding portion of the cylinder bore when the cylinder liner is mounted within the cylinder bore, and

(3) stop means for holding said cylindrical body in a generally fixed axial position, said stop means including a radially oriented stop surface positioned outwardly from said inside flow control surface to engage the liner support surface.

4,440,119
ELECTRONIC FUEL INJECTING METHOD AND DEVICE FOR INTERNAL COMBUSTION ENGINE

Nobuyuki Kobayashi, Toyota, and Toshiaki Isobe, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 23, 1982, Ser. No. 391,432
Claims priority, application Japan, Feb. 2, 1982, 57-15097
Int. Cl.³ F02D 5/02
U.S. Cl. 123—492 **9 Claims**

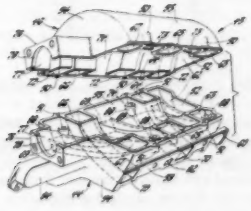


1. Electronic fuel injecting method for an internal combustion engine, wherein a basic injection time is obtained in accordance with an intake pressure of the engine and an engine rotational speed, and, during transition, said basic injection time is corrected in accordance with the operating conditions of said engine so as to determine a fuel injection time, characterized in that, when a change in value of the intake pressure in every first predetermined time period exceeds a first criterion value, an increase correction for acceleration or a decrease correction for deceleration is effected, in case said change in value of the intake pressure in every first predetermined time period does not exceed said first criterion value, if a change in value of the intake pressure in every second predetermined time period being longer than said first predetermined time period exceeds a second criterion value, at least an increase correction for acceleration is effected, and if said change in value of the intake pressure does not exceed said second criterion value, neither an increase correction for acceleration nor a decrease correction for deceleration is effected.

4,440,120
COMPACT RAM TUBE ENGINE AIR INTAKE MANIFOLD

Paul E. Butler, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 24, 1982, Ser. No. 381,076
Int. Cl.³ F02B 75/22
U.S. Cl. 123—52 MV **5 Claims**



2. A compact ram tube plenum type intake manifold for an internal combustion engine having V-arranged cylinder banks with opposed inner side walls and spaced cylinder intake ports opening through said walls, said manifold comprising

outer walls of curved elongated partially cylindrical configuration and compact construction sized to be disposed between such engine cylinder banks, said outer walls internally defining the periphery of a barrel like space having a bottom, opposite sides and an upper periphery,

two laterally spaced longitudinally extending external mounting surfaces formed on said outer walls along opposite sides of the manifold and adapted to engage the opposed side walls of such engine cylinder banks, said outer walls having outlet openings through the mounting surfaces from adjacent sides of the barrel like space and spaced to be aligned and connect with the cylinder intake ports upon assembly of the manifold to the engine,

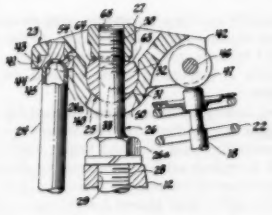
internal walls within said outer walls and defining in said barrel like space a plenum and individual ram intake passages, said passages being located immediately inboard the outer walls and each extending in coiled fashion peripherally within said space, one from each outlet opening, across the bottom of the space, up the opposite side, across the upper periphery and down to an inlet opening from the space, each said inlet opening being located on the same side of the manifold as the outlet opening of its respective ram intake passage, those of said ram intake passages which open through diverse ones of said mounting surfaces being oppositely curved and interdigitated with each other around a central portion of said plenum to direct flows from the plenum in curving paths of opposite sense through their respective outlet openings to the cylinder intake ports of the opposed cylinder bank walls, and

an intake conduit supported on the outer walls and extending longitudinally from one end of the plenum to define an inlet passage connectable with associated induction means for providing induction air to the plenum for delivery to the ram intake passages.

4,440,121
LOCKNUT DEVICE FOR ENGINE ROCKER ARM ADJUSTMENT

Terence J. Clancy, Lake Orion, and David G. Kokochak, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1982, Ser. No. 373,658
Int. Cl.³ F01L 1/18
U.S. Cl. 123—90.39 **3 Claims**



1. A reciprocating internal combustion engine of the type having an engine housing defining at least one cylinder with a port, a valve reciprocably mounted to open and close the port and normally spring biased to a port closing position, a valve actuator means, including a self-adjusting lifter, spaced from the valve and movable in the opposite sense to reciprocate the valve, a support stud fixed at one end to the engine housing and having external threads at its opposite free end, a nut threaded onto the support stud, a fulcrum means encircling the support stud and having a reaction surface on one side thereof for abutment against the bearing surface of the nut, an apertured rocker arm positioned by the support stud for engagement by

the valve and the valve actuator means and adapted to be actuated in rocking movement about the fulcrum means to reciprocate the valve against the spring bias to open and close the port during engine operation, and a retainer means operatively associated with the fulcrum means to prevent its rotation about the axis of the support stud, the improvement wherein: said reaction surface and said bearing surface of said fulcrum means and said nut, respectively, are each inclined in complement to each other, at an angle of at least five degrees relative to a plane perpendicular to the axis of the support stud whereby to define a cam lock means to prevent rotation of said nut relative to said support stud as a result of engine vibration.

4,440,122

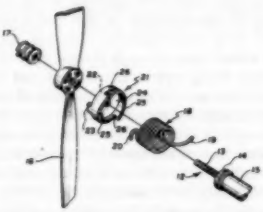
MODEL AIRPLANE ENGINE STARTER

Roger D. Theobald, Mission Veijo, Calif., assignor to Cox Hobbies Inc., Santa Ana, Calif.

Continuation of Ser. No. 114,247, Jan. 22, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,054

Int. Cl.³ F02N *5/02*

U.S. Cl. 123—185 D **2 Claims**



1. A self-starter for a model internal-combustion engine of the type having a source of power, a rotatable shaft operated by said source, and a propeller secured to said shaft, said starter comprising

a coiled spring for mounting over said shaft in surrounding relation, and

a connector constructed and arranged to be carried by said shaft in interconnecting driving relation between said spring and the propeller and in surrounding relation with at least one convolution of said spring,

said connector having opposite ends and a propeller-engaging drive element extending outwardly from one of its ends to engage the propeller and be driven thereby therewith,

said connector having a spring-engaging element at its opposite end constructed and arranged to be automatically engaged by said spring in biased relation whenever said connector is rotated in contra-normal direction by the propeller,

said spring having a stationary end formed for attachment to the engine and having a free end formed for attachment to said connector, said free end being constructed and arranged to engage said spring-engaging element in biasing relation when said connector is rotated in a contra-normal direction and to bear against and ride upon one end of said connector in non-engaging relation to said element when said connector is rotated by the propeller in a normal direction.

4,440,123

HALF SPEED BALANCER

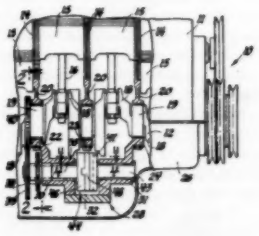
Lung-Wen Tsai, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1982, Ser. No. 343,450

Int. Cl.³ F16F *15/26*

U.S. Cl. 123—192 B **5 Claims**

1. In combination, support means carrying an operable mechanism having in operation a repetitious unbalance occurring in a predetermined cycle and a half speed balancer comprising at least one Oldham coupling device having a pair of end members rotatably connected by a coupler between the end members, said end members being mounted to said support means for rotation on offset parallel axes and at least one of said end members being connected for driving in timed relation with said mechanism at a rotational speed equal to one half the cyclic speed of said repetitious unbalance, said coupler being connected to said end members by abutments contacting along laterally and longitudinally extending surfaces, the surfaces associated with the diverse end members lying at substantial



rotational angles to one another such that said coupler is rotatably driven by said end members at a speed equal to the rotational speed of the end members while being eccentrically displaced such that the center of gravity of the coupler travels in a closed curving path at a rotational speed equal to the cyclic speed of the repetitious unbalance, said Oldham coupling device being so oriented as to effect the displacement of said coupler in a manner to oppose at least a portion of said mechanism cyclic unbalance and the mass of said coupler being chosen to offset a predetermined part of. said opposed portion of mechanism unbalance.

4,440,124

INTERNAL COMBUSTION ENGINE

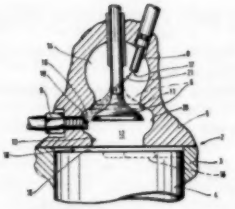
Konrad Eckert, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 23, 1982, Ser. No. 410,822

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207179

Int. Cl.³ F02B *19/12*

U.S. Cl. 123—261 **7 Claims**



1. An internal combustion engine, comprising at least one cylinder; a piston movable in said cylinder; a cylinder head connected with said cylinder; an aspiration passage; an inlet valve movable between open and closed positions; a combustion chamber formed on said piston at a side of said cylinder head; an additional combustion chamber form in said cylinder head between said first mentioned combustion chamber and said inlet valve and having an axis and a circular periphery; means for producing a twisted stream rotating about said axis; an injecting nozzle which opens in said aspirating passage and is arranged to inject fuel into said additional combustion cham-

ber via said inlet valve in its open position; and external igniting means arranged in the region of said periphery of said additional combustion chamber, said injecting nozzle being formed as a single-hole nozzle and having an injection hole which is directed substantially against said igniting means.

4,440,125

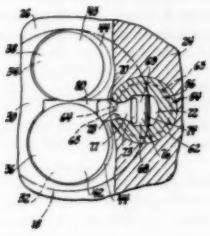
DIESEL ENGINE COMBUSTION CHAMBER

James L. Case, Okemos, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 18, 1981, Ser. No. 264,472

Int. Cl.³ F02B *19/08*

U.S. Cl. 123—293 **8 Claims**



1. In combination in a diesel engine, means defining a closed end cylinder, a piston reciprocably carried in the cylinder and defining a main combustion chamber at the closed end of the cylinder, a precombustion chamber formed in the cylinder defining means and closed by a bottom wall, said main combustion chamber being connected with said precombustion chamber by a gas passage through said bottom wall, said passage including main and branch portions, said main portion being of substantially constant depth and having a base section of relatively great width and large cross-sectional area opening into the precombustion chamber to provide controlled swirl and turbulence therein of gas delivered from the main combustion chamber, said branch portion connecting an intermediate point of the main passage portion to an interior zone of the precombustion chamber from which to receive an initial outflow of combustion gases into the gas passage and a venturi section in the main passage portion and extending from the base section, said venturi section being disposed substantially between said intermediate point and an opening to the main combustion chamber, said opening being of lesser width than said base section, and said venturi section having a throat narrower than said opening and smoothly extending to the wider opening and base section to moderately restrict outflow of gases from the precombustion chamber and thereby cause increased combustion in the passage base section and greater penetration of outflowing gases into the main combustion chamber while avoiding excessive restriction to flow in either direction between the main and precombustion chambers.

4,440,126

BRAKING DEVICE FOR A VALVE CONTROLLED INTERNAL COMBUSTION ENGINE

Hubert Abermeth; Andreas Deckert, both of Cologne; Helmut Müller, Bensberg, and Jurgen Wahnschaffe, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

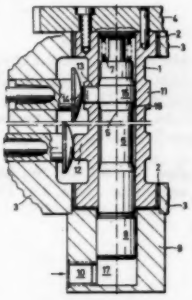
Division of Ser. No. 229,124, Jan. 28, 1981, Pat. No. 4,378,765. This application Jan. 14, 1983, Ser. No. 458,141

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 3003566

Int. Cl.³ F02D *13/04*

U.S. Cl. 123—321 **5 Claims**

1. A braking device for a valve controlled internal combustion engine for motor vehicles, with each cylinder having at least one exhaust valve, said braking device comprising a camshaft for controlling said at least one exhaust valve for opening thereof, said camshaft having a main cam for moving operation, and a supplementary cam which additionally becomes effective during braking operation, said supplementary cam being arranged in the plane of said main cam and being capable of being selectively lowered in said camshaft, a control shaft arranged in the rotational axis of said camshaft, said control shaft serving for actuation of said supplementary cam,



said control shaft being axially displaceable in said camshaft, and including a section with conical sides in the region of said supplementary cam, a pressure spring arranged on one end face of said control shaft, said pressure spring being effective counter to the direction of shift of said control shaft, said control shaft including two abutments, and an angle lever, said angle lever being connected to said control shaft between said two abutments by means of a sliding piece, and said angle lever being rotatable against the force of said pressure spring for displacing said control shaft in the operating position.

4,440,127

ELECTRONIC CONTROL DEVICE FOR THE FUEL METERING SYSTEM OF AN INTERNAL COMBUSTION ENGINE

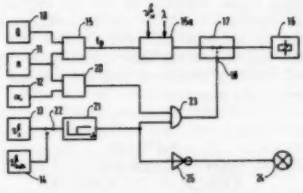
Gustav Virgilio, Winnenden, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,556

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210512

Int. Cl.³ F02D *5/00*

U.S. Cl. 123—325 **8 Claims**



1. An electronic control device for the fuel metering system of an internal combustion engine for use with a vehicle comprising, a switching means for suppressing the fuel supply during overrun operations of said engine, a processed temperature signal means responsive to at least one of an intake air temperature sensor means for said engine and to the output signal of an ambient air temperature sensor means located in the body of said vehicle for detecting the formation of ice

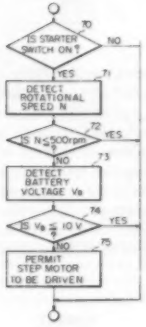
exterior to said vehicle, and said switching means being responsive to said temperature signal means.

7. A method for fuel metering in an internal combustion engine comprising the steps of, sensing the temperature of the intake air for said engine as part of a processed temperature signal, sensing the temperature of the ambient air as another part of a processed temperature signal, providing fuel metering signals for suppressing the fuel supply to said engine, and inhibiting said fuel metering signals in response to at least one of said parts of said processed temperature signal during overrun operation of said engine.

4,440,128
METHOD AND APPARATUS FOR CONTROLLING THE IDLING ROTATIONAL SPEED OF AN INTERNAL COMBUSTION ENGINE

Jiro Nakano, Okazaki, and Yohei Watanabe, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 18, 1982, Ser. No. 340,253
Claims priority, application Japan, Jan. 19, 1981, 56-5128
Int. Cl.³ F02D *33/02*
U.S. Cl. 123—339 **16 Claims**



1. A method for controlling the idling rotational speed of an internal combustion engine having a step motor for adjusting the idle air flow to the engine when a drive signal, which is determined depending upon the operating condition of the engine, is applied thereto, said method comprising the steps of:

generating a cranking signal which indicates the engine is cranking;

generating at least one engine parameter signal which indicates the operating condition of the engine;

judging, in response to the engine parameter signal and the cranking signal, whether or not the engine is under a certain operating condition, during cranking, wherein the step motor cannot be normally actuated; and

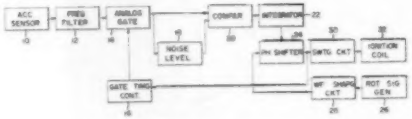
when the engine is under said certain operating condition during cranking, inhibiting said drive signal from being applied to the step motor.

4,440,129
IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toshio Iwata, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 370,996, Apr. 22, 1982, abandoned, which is a continuation of Ser. No. 147,542, May 7, 1980, abandoned. This application Aug. 17, 1983, Ser. No. 523,902
Int. Cl.³ F02P *5/14*
U.S. Cl. 123—425 **2 Claims**

1. An ignition timing control system for an internal combustion engine comprising an acceleration sensor for sensing an acceleration of a vibration of an internal combustion engine, a discrimination means for removing noise signal components from an output from said acceleration sensor and for selecting a knock signal component, said discrimination means including at least an analog gate for interrupting and controlling the passage of said output from said acceleration sensor therethrough and a gate timing controller for closing said analog gate for predetermined time intervals, each of said intervals commencing with each time point at which said engine is ignited and arranged so as to eliminate ignition noise components from said sensor output, a reference ignition timing generator means for generating a reference ignition timing signal, a phase shifting means responsive to an output from said discrimination means to shift a phase of said reference ignition timing signal, an ignition coil, and switching means for interrupting the flow of current to said ignition coil in synchronism with an output from said phase shifting means;

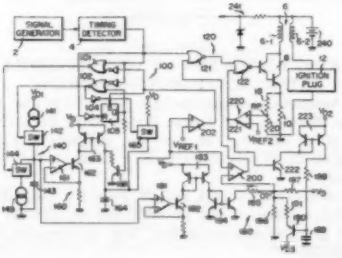


wherein said discrimination means further comprises a noise level circuit means and a comparator means and an integrator means operatively serially connected between said analog gate and said phase shifter, wherein said noise level circuit means generates a DC voltage having a value which is higher than a peak value of mechanical noise components of said output of said acceleration sensor, and wherein said comparator means compares said output from said analog gate with an output from said noise level circuit means so as to eliminate said mechanical noise components from said output of said acceleration sensor means, and wherein said integrator means integrates an output from said comparator so as to provide an integrated voltage which is dependent upon an intensity of detected knocking of said internal combustion engine.

4,440,130
IGNITION CONTROL DEVICE

Yasuo Taguchi, Yokohama, and Satoshi Nakao, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 14, 1981, Ser. No. 283,347
Claims priority, application Japan, Jul. 15, 1980, 55-96750; Jul. 15, 1980, 55-96757
Int. Cl.³ F02P *5/08*
U.S. Cl. 123—427 **22 Claims**



1. An ignition control device for an internal combustion engine comprising:

signal generating means for generating an output signal

having a frequency which corresponds to the rotation speed of said internal combustion engine;

voltage storing means for storing a voltage having a level which corresponds to the rotation speed of said engine;

saw-tooth wave generating means for generating, in response to said signal generating means output signal, a saw-tooth wave signal having a frequency which corresponds to that of the output signal generated from said signal generating means and having a slope corresponding to the output voltage applied from said voltage storing means, said saw-tooth wave signal of each engine rotation starting from a predetermined voltage level at a timing signal synchronized with the output signal from said signal generating means;

first and second reference voltage generating circuits for generating first and second reference voltages;

first control means for comparing the first reference voltage with the saw-tooth wave signal generated from the saw-tooth wave generating means at a timing synchronized with the output signal applied from said signal generating means, and for controlling the voltage stored in said voltage storing means according to the difference between the levels of said first reference voltage and said saw-tooth wave signal; and

second control means for generating an ignition control signal when the saw-tooth wave signal generated from the saw-tooth wave generating means has reached the second reference voltage level.

4,440,131
REGULATING DEVICE FOR A FUEL METERING SYSTEM

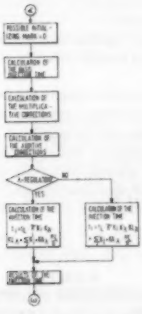
Günter Felger, Leonberg; Otto Glöckler, Renningen; Helmut Kauff, Schwieberdingen; Uwe Kiencke, Ludwigsburg; Heinrich Knapp, and Herbert Stocker, both of Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 21, 1981, Ser. No. 294,877

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1980, 3036107

Int. Cl.³ F02D 5/00; F02M 7/12

U.S. Cl. 123—440 **7 Claims**



1. A regulating device for a fuel metering system in an internal combustion engine comprising,

a signal generator circuit for generating a fuel metering signal,

an O_2 sensor coupled with a regulator for exerting a supplementary influence upon said metering signal, said regulator producing a regulating corrective signal,

at least one means for smoothing said corrective signal,

memory means for storing the output of one of said at least one smoothing means in dependence upon operating parameters of the engine, and

subsequent regulator means responsive to said at least one smoothing means receiving said corrective signal, and means for influencing said metering signal additively and multiplicatively in dependence on engine parameters, wherein

(a) said means for additively influencing said metering signal is controlled via said subsequent regulator means by one of said at least one smoothing means and by said memory means, and

(b) said means for multiplicatively influencing said metering signal is controlled via said subsequent regulator means by one of said at least one smoothing means.

4,440,132
FUEL INJECTION SYSTEM

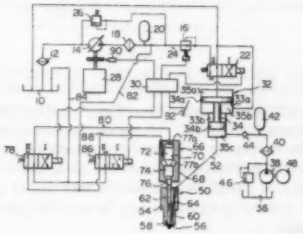
Tomohiko Terada, and Hideaki Komada, both of Higashi Matsuyama, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Jan. 19, 1982, Ser. No. 341,041

Claims priority, application Japan, Jan. 24, 1981, 56-9168

Int. Cl.³ F02M 57/02, 39/00

U.S. Cl. 123—446 **6 Claims**



1. A fuel injection system comprising:

a source of fuel supply;

a booster operated by a pressure differential between opposite ends thereof to compress fuel fed from the source of fuel supply to one end thereof, the fuel developing a first hydraulic fluid pressure;

a fuel injector for injecting a supply of compressed fuel from the booster;

a nozzle needle actuator operatively associated with the fuel injector and operated by a pressure differential between opposite ends thereof to start and terminate a fuel injection from the fuel injector;

a source of hydraulic fluid supply;

first hydraulic circuit means for producing a predetermined level of hydraulic fluid pressure and communicated with the source of hydraulic fluid supply;

a pressure control means for controlling the predetermined hydraulic fluid pressure in the first hydraulic circuit means and supplying the controlled pressure to the other end of the booster through a first direction control means as a second hydraulic fluid pressure;

second hydraulic circuit means for selectively communicating through a second direction control means one end of the nozzle needle actuator to the first hydraulic circuit means and the source of hydraulic fluid supply;

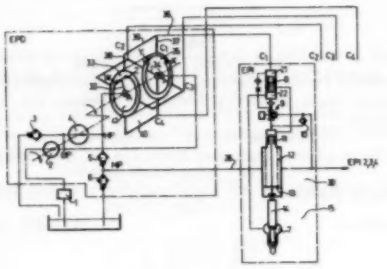
a third hydraulic circuit means for selectively communicating through a third direction control means the other end of the nozzle needle actuator to the source of hydraulic fluid supply when said one end is communicated to the first hydraulic circuit means and to the first hydraulic circuit means when said one end is communicated to the source of hydraulic fluid supply; and

a control means for controlling the output pressure of the pressure control means and the states of the first to third direction control means.

4,440,133
DEVICE FOR PREMETERED PRESSURE-TIME INJECTION

Jean-Pierre Jourde, Lyons, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 27, 1982, Ser. No. 424,916
Claims priority, application France, Oct. 15, 1981, 81 19395
Int. Cl.³ F02M 39/00
U.S. Cl. 123—446 5 Claims



1. An electronically controlled device for premetered pressure-time injection of a motor using a predetermined high injection pressure and low feed pressure, comprising:

means for supplying a predetermined medium pressure of a value which is intermediate said high and low pressures;

a plurality of cylinders mounted in said motor and operatively connected to said means for supplying said medium pressure;

a single piping system connected to each of said cylinders;

two stage, rotary distributor means for cyclically distributing the high and low pressure as a function of the number of said cylinders into said single piping system for each of said cyclinders, without overlapping of high pressure and low pressure communication time periods;

a plurality of injector nozzle units which are each respectively operatively associated with each of said cylinders and wherein each of said injector nozzle units further comprise;

an injector having a needle chamber formed therein;

an injector nozzle;

a metering piston mounted in said injector nozzle wherein a delivery chamber, injector chamber and control chamber are formed in said injector nozzle and connected to said single piping system of a corresponding cylinder and wherein the injector chamber is connected to the needle chamber of the injector;

a first unidirectional flow valve;

a medium pressure channel formed in said injector nozzle unit;

a second channel formed in said injector nozzle unit;

a three-channel electrovalve; and

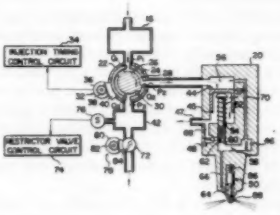
an injector control piston wherein the control chamber is connected, on the one hand, to the means for supplying a medium pressure through said unidirectional flow valve and wherein said unidirectional control valve is positioned in a direction for allowing said control chamber to be fueled, and, on the other hand, via three-channel electrovalve, through said medium pressure channel, for initiating injection, and through the second channel, to the injection chamber for initiating metering; and

electronic means synchronized with the rotation of the distributor and of the motor for triggering initiation of injection and initiation of metering by means of the electrovalve.

4,440,134
FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kiyoharu Nakao, Isehara, and Fumihide Sato, Yokohama, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,180
Claims priority, application Japan, May 15, 1981, 56-73114; Jun. 17, 1981, 56-87919; Jun. 17, 1981, 56-87923; Jun. 22, 1981, 56-90811
Int. Cl.³ F02M 47/02
U.S. Cl. 123—447 10 Claims



1. A fuel injection system for an internal combustion engine having at least one cylinder and a cam shaft operatively associated therewith, comprising:

a fuel pump driven by said engine for delivering fuel;

first accumulator means for receiving and storing the fuel from said fuel pump;

rotary valve means having an inlet port connected with said first accumulator means, at least one outlet port and a drain port, said rotary valve means comprising a housing, a sleeve mounted for rotation within said housing, said sleeve having at least one opening formed therein and rotary shaft means mounted for rotation within said sleeve, said rotary shaft means being rotated in synchronism with said cam shaft and having means for selectively connecting the outlet port with the inlet port and the drain port;

means for automatically controlling position of said sleeve relative to said housing in response to number of revolutions of the engine;

second accumulator means connected at one end with the drain port of said rotary valve means and at the other end with a tank;

variable restrictor valve means disposed between said second accumulator means and said tank;

means for automatically controlling degree of opening of said variable restrictor valve means in response to fluid pressure in said second accumulator means; and

at least one injector means connected with the outlet port of said rotary valve means for injecting the fuel into said cylinder.

4,440,135
FUEL INJECTION SYSTEM PROVIDED WITH FUEL INJECTION VALVES HAVING CONTROLLABLE VALVE OPENING PRESSURE

Toshiaki Asami, Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1982, Ser. No. 367,681
Claims priority, application Japan, Apr. 16, 1981, 56-55048[U]
Int. Cl.³ F02M 47/02, 51/00
U.S. Cl. 123—467 14 Claims

1. A fuel injection system for combination with an internal combustion engine, comprising:

a fuel injection pump;

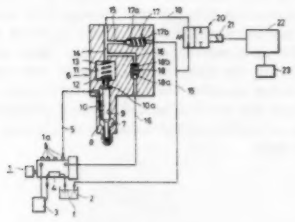
pump means for feeding fuel under pressure to said fuel injection pump;

at least one fuel injection valve arranged to be supplied with fuel pumped by said fuel injection pump, said fuel injection valve including a nozzle needle arranged to be lifted by the pressure of said pumped fuel to cause injection of said pumped fuel into said engine, and means elastically urging said nozzle needle against a lifting motion thereof;

first supplementary back pressure applying means for causing the pressure of leaked fuel produced by a lifting motion of said nozzle needle to act upon said nozzle needle against said lifting motion thereof; and

second supplementary back pressure applying means responsive to at least one operating condition of said engine for causing the pressure of pressurized fuel suppled from said pump means for supplying said fuel under pressure to act upon said nozzle needle against a lifting motion thereof;

said second supplementary back pressure applying means including:



a first passageway connecting said pump means to said fuel injection valve for feeding pressurized fuel suppled from said pump means and being applied to said nozzle needle;

a second passageway connecting said fuel injection valve to a lower pressure zone for guiding said leaked fuel and said pressurized fuel to said lower pressure zone;

a first valve arranged for opening and closing said second passageway;

a further valve arranged for closing said first passageway when the pressure of fuel acting upon said nozzle against said lifting motion thereof is higher than the pressure of pressurized fuel supplied from said pump means for feeding said fuel under pressure; and

valve controlling means responsive to at least one operating condition of said engine for controlling said first valve.

4,440,136

ELECTRONICALLY CONTROLLED FUEL METERING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Helmut Denz, and Hans Barho, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 314,144

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042246

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—491 **5 Claims**

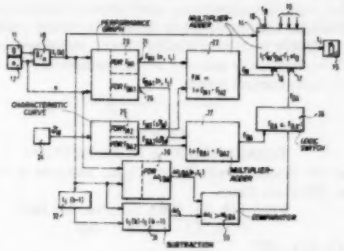
1. An electronically controlled fuel metering system for an internal combustion engine, which comprises;

speed sensing means for determining engine rpm values;

temperature sensing means for determining engine temperature values;

basic metering signal generating means for generating a basic metering signal;

signal correction means, connected to receive said basic metering signal, for correcting said basic metering signal to provide an enriched fuel-air mixture, said signal correction means determining at least one correction value K in accordance with the formula $K=1+K1 \times K2$, wherein K1 is a first corrective value dependent on at least said basic metering signal and said rpm values, and K2 is a second corrective value which is dependent on at least said engine temperature values, said signal correction means including memory means for storing engine perfor-



mance graph data including first corrective factors K1 as a function of said basic metering signal and rpm and storing engine characteristic curve data including second corrective factors K2 as a function of engine temperature.

4,440,137

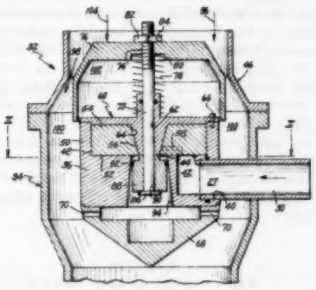
SUPPLEMENTAL FUEL SUPPLY DEVICE FOR I.C. ENGINE

Thomas Lagano, Juno Beach, and William H. Batchelor, Jenson Beach, both of Fla., assignors to Propane Carburetion Systems, Inc., Stuart, Fla.

Filed Jul. 12, 1982, Ser. No. 397,168

Int. Cl.³ F02M *21/02*

U.S. Cl. 123—525 **12 Claims**



1. A control valve for a gas fuel supply to an internal combustion engine including an air intake conduit means comprising:

a valve housing including an air duct extending through the housing and having inlet and outlet ends, the housing arranged to be connected to said air intake conduit means so that the outlet end of said air duct is in communication with said conduit;

a movable air flow responsive member in said duct arranged to be deflected in a first direction by forces resulting from air flowing through said duct towards the outlet end thereof;

means for resiliently biasing said air flow responsive member in a direction opposite to said first direction of deflection towards a nondeflected position;

a gas fuel inlet into the housing;

a gas fuel passageway in the housing providing communication between said gas fuel inlet and said air duct at a point between said air flow responsive member and the outlet end of said duct;

a valve element for controlling gas fuel flow through said passageway, said valve element movable between closed and open positions in response to the movement of said air flow responsive member between undeflected and deflected positions, respectively; and

valve element control means for moving said valve element towards and maintaining same at a closed position independently from said biasing means; movement of said air flow responsive member being unrestricted by said valve element control means.

4,440,138

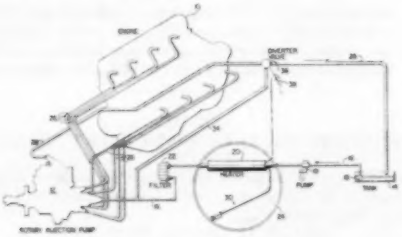
DIESEL ENGINE FUEL SYSTEM

Arthur W. Smith, Glastonbury, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Feb. 16, 1982, Ser. No. 349,060

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **5 Claims**



1. In a diesel engine fuel system including a tank, an injector for introducing fuel to the engine and having a connection with a line for returning fuel to the tank, the system also including a delivery line from the tank to the injector wherein a temperature responsive fuel heater and a fuel filter are connected, the filter being downstream from the heater, the improvement comprising a diverter line connected to the return line and also connected to the delivery line downstream of the heater, and a valve controlling flow in the diverter line and the return line and operable to permit complete flow through the return line only when the said heater is not operating and to permit flow through the diverter line and simultaneous limited flow through the return line to the tank only when the heater is operating.

4,440,139

VACUUM CONTROL VALVE

Mitikatu Naito, Nagoya; Kiyotosi Yano; Kazuo Itou, both of Kariya, and Kunihiro Tsuzuki, Ohbu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 15, 1982, Ser. No. 398,711

Claims priority, application Japan, Jul. 20, 1981, 56-107366[U]

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **3 Claims**

1. A vacuum control valve for controlling an amount of exhaust gas to be recirculated into combustion chambers of an engine comprising:

a cover and a housing;

a vacuum port formed on said cover and to be connected with a vacuum source;

an output port formed on said cover and to be connected with a diaphragm chamber of a EGR valve of said engine;

a vacuum modulating chamber formed in said cover and communicated with said output port and having diaphragm;

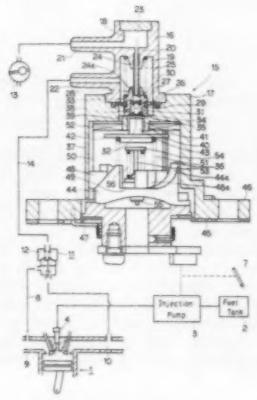
a movable member coupled with an opening of said diaphragm so as to be moved with said diaphragm, said movable member having therein a valve chamber and a valve port opening to said vacuum modulating chamber, said movable member further having a hole for communicating said valve chamber with the atmosphere;

a valve member disposed in said valve chamber and facing to said valve port;

a first spring disposed in said valve chamber for biasing said valve member towards said valve port;

a pipe disposed in said vacuum modulating chamber, one end thereof being communicated with said vacuum port and the other end projecting into said valve port for introducing a negative pressure from said vacuum source into said vacuum modulating chamber;

a second spring disposed in said vacuum modulating chamber and biasing said movable member in such a direction that said movable member is moved away from said pipe, whereby when the negative pressure in said vacuum modulating chamber exceeds a preset load determined by the biasing force of said second spring said valve member seats on said other end of said pipe for cutting off the communication between said vacuum port and said vacuum modulating chamber and said vacuum modulating chamber is communicated with said valve chamber for introducing the atmospheric pressure into said vacuum modularing chamber through said valve port, thereby to modulate the pressure in said vacuum modulating chamber at a predetermined value in accordance with said preset load;



a cam chamber formed in said housing;

a cam member rotatably disposed in said cam chamber and being linked with an acceleration pedal;

a cam follower means disposed in said cam chamber and having a cam follower being in contact with a cam surface of said cam member;

a spring holder disposed in said cam chamber;

a guide hole formed in a wall of said housing into which a guide portion of said spring holder is inserted and by which said spring holder is guided, so that the end of said guide portion is in contact with said movable member; and,

a third spring disposed in said cam chamber and between said cam follower means and said spring holder for urging said spring holder in a direction opposite to the biasing direction of said second spring, whereby when said cam member is rotated the urging force of said third spring becomes larger and thereby said preset load of said second spring is changed so as to change the predetermined value at which the pressure in said vacuum modulating chamber is controlled;

wherein the improvement comprises:

a push rod axially movably held in said cam follower means; and

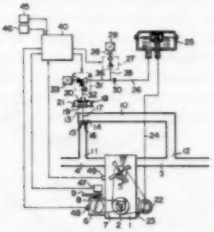
a fourth spring for urging said push rod in a direction towards said spring holder,

said push rod coming into contact with said spring holder when a rotational angle of said cam member exceeds a predetermined angle for applying the spring force of said fourth spring to said spring holder.

4,440,140
DIESEL ENGINE EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Michio Kawagoe, and Masaaki Tanaka, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 14, 1982, Ser. No. 398,446
Claims priority, application Japan, Aug. 27, 1981, 56-134511
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **3 Claims**



1. For a diesel engine for a vehicle, comprising an air intake passage, an exhaust passage, and an exhaust gas recirculation passage whose upstream end is communicated to an intermediate point of said exhaust passage and whose downstream end is communicated to an intermediate point of said air intake passage.

an exhaust gas recirculation control system, comprising:

(a) a fluid pressure operated exhaust gas recirculation control valve which controls the flow resistance of said exhaust gas recirculation passage according to a control fluid pressure supplied thereto so as to increase the flow resistance to a maximum substantially infinite valve as the control fluid pressure approaches atmospheric pressure;

(b) an electrically operated switching over valve which, when actuated, changes over said control fluid pressure supplied to said exhaust gas recirculation control valve to atmospheric pressure; and

(c) an exhaust gas recirculation control signal generating system, including a means for detecting engine load and jerk, which outputs a first fluid pressure control signal which is supplied to said exhaust gas recirculation control valve as said control fluid pressure so as to provide an appropriate amount of exhaust gas recirculation according to engine load, and a second electric control signal which actuates said switching over valve when the rate of change of engine load is greater than a certain predetermined value.

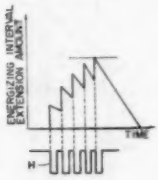
4,440,141
METHOD AND APPARATUS FOR CONTROLLING ENERGIZING INTERVAL OF IGNITION COIL OF AN INTERNAL COMBUSTION ENGINE

Masakuni Tsujimura, Anjyo; Hideo Miyagi, Okazaki; Mamoru Kohashi, Aichi, and Masaaki Kurii, Toyoake, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 25, 1981, Ser. No. 247,553
Claims priority, application Japan, Mar. 26, 1980, 55-39540
Int. Cl.³ F02P *9/00*
U.S. Cl. 123—609 **11 Claims**

1. A method for controlling the energizing interval of an ignition coil of an internal combustion engine equipped with an electronic control device for energizing said ignition coil, said energizing interval being determined basically on the basis of the rotational speed of said engine, said method comprising the steps of:

generating a pulse train signal indicative of the acceleration of said engine by detecting the opening degree of a throttle valve associated with said engine such that the pulse period changes in accordance with the accelerating rate; and

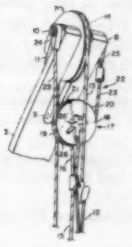


correcting said energizing interval by adding thereto an extension amount which is either a function of said rotational speed of said engine or a given upper limit value at said rotational speed of said engine in response to each pulse of said pulse train signal such that said extension amount is increased by a predetermined value in esponse to each pulse of said pulse train signal, while said extension amount is decreased in accordance with lapse of time at an interval between two consecutive pulses of said pulse train signal.

4,440,142
COMPOUND BOW CABLE TENSION ADJUSTER

Gary Simonds, Gainesville, Fla., assignor to Kidde Recreation Products, Inc., Northbrook, Ill.

Filed Sep. 28, 1982, Ser. No. 425,682
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—23 R **13 Claims**



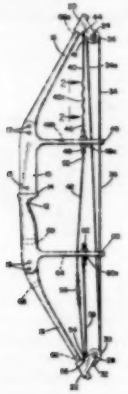
1. A compound bow including, a center handle section supporting upper and lower limbs having tips, a cam element pivotally attached respective each said limb, a tension cable extending from each said cam element of one said limbs, in a cable end attachment adjacent the opposite one of said limbs, said tension cable terminating in said cable end attachment means adjustably anchoring each said cable end attachment relative its respective said limb, said adjustable anchoring means each including a bridle cable having side portions carried by one said limb and an intermediate portion, a disc engaged and supported by said bridle cable intermediate portion, a plurality of attachment portions formed in said disc disposed varying distances from the center of said disc, and said cable end attachment anchored to said disc by engagement with one of said disc attachment portions whereby, each said cable end attachment is selectively engageable in alternate ones of said disc attachment portions to vary the tuning of said bow.

4,440,143

ARCHERY BOW

Jim Z. Nishioka, 1268 Hemlock NW., Salem, Oreg. 97304

Filed Apr. 28, 1982, Ser. No. 372,733
Int. Cl.³ F41B 5/00
U.S. Cl. 124—24 R 2 Claims



1. An archery bow comprising
(a) a bow frame,
(b) a grip on said frame for gripping said bow,
(c) a pair of flexible oppositely extending bow arms with tip ends on said frame and at least one of said arms flexing to provide a tension force in the bow, said arms comprising first and second arms with first and second tip ends respectively,
(d) a bowstring extending between said arm tip ends, said bow having a rest condition and a drawn condition, the bow in said rest condition being the condition of the bow prior to an application of a drawing force on the bowstring and the bow in said drawn condition being the condition of the bow after a drawing force has been applied to the bowstring,
(e) eccentric means on said first tip end for providing a breakover for the bowstring,
(f) a rotatable non-eccentric bowstring guide member supported by a shaft on said second tip end for guiding said bowstring,
(g) link means positioned between said arms for tensioning said second arm, said link means being in addition to said bowstring,
(h) anchor means on said bow for anchoring said link means to said bow,
(i) and connecting means on said link means operatively connecting said link means to said second arm and to said anchor means so that when the bowstring is drawn said link means will restrict flexing movements of said second arm during a breakover of said eccentric means while allowing said first arm to flex to provide tension force for said bow.

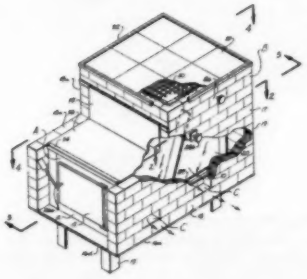
4,440,144

HEATER APPARATUS AND METHOD

William E. Masters, 138 Norris Ave., Liberty, S.C. 29657

Filed Aug. 25, 1980, Ser. No. 181,078
Int. Cl.³ F24C 1/14
U.S. Cl. 126—61 8 Claims

1. Fuel burning heater apparatus for heating an interior room space of a building of the type having a metal firebox defined by spaced sidewalls, top and bottom walls, and spaced front and rear walls, said walls being integrally joined and said front wall having a closable opening through which fuel may be loaded, wherein said heater apparatus comprises:
a ceramic enclosure enclosing at least said side and back metal walls;
said ceramic enclosure having ceramic mass walls spaced from said metal walls defining heat transfer air passages therebetween into which heat from said metal walls is transferred and which may thereafter be transferred into said interior room space by forced air flow convection;
said ceramic mass walls being in sufficient close proximity to said metal walls to absorb the heat from said metal walls when air flow is not established in said air passages for effective radiation of said absorbed heat into said interior space;
air outlets communicating with said air passages for delivering air outwardly into said interior space;
blower means communicating with said air passages for delivering air through said air passages and said air outlets;



heat transfer control means for controlling operation of said blower and for controlling transfer of heat into said interior space by either said convection or radiation;
said metal walls for conducting heat quickly into said air passages;
said ceramic mass walls for radiating heat in said air passages gradually and directly into said interior room space at a much slower rate than said metal walls;
said heat transfer control means for controlling said blower means having an on mode for delivering air into said interior room space and rapidly distributing and transferring said heat in said air passages by forced convection to quickly elevate the temperature of said interior space to a desired temperature; and
said heat transfer control means having an off mode wherein air flow through said heat transfer air passages is terminated and heat is released and transferred directly into said interior room space by said gradual radiation of heat from said ceramic mass walls to maintan said desired temperature in said interior space in a constant and uniform manner generally without large temperature fluctuations.

4,440,145

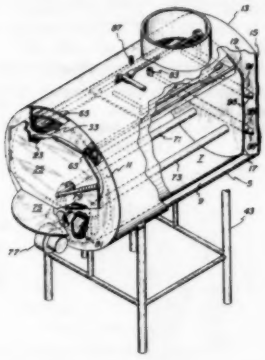
WET-BASED, WOOD-BURNING BOILER

Peter A. Neyenhouse, Rte. 2, Box 322B, Morrisonville, N.Y. 12962

Filed Apr. 7, 1983, Ser. No. 482,878
Int. Cl.³ F24C 1/14
U.S. Cl. 126—61 8 Claims

1. A wood-burning device comprising a combustion chamber, flue means and secondary damper system means; said combustion chamber having a main body cylindrical wall, a front wall and a rear wall, said combustion chamber burning wood therein, said flue means being in the top portion of said main body cylindrical wall and adjacent said rear wall, said secondary damper system means being reciprocable to an open

position and a closed position, said secondary damper system means in its said open position non-interferingly allowing smoke, flue gases and products of combustion to exhaust directly through said flue means, said flue means being of sufficient size to provide draft to exhaust non-interferingly and directly from said combustion chamber the smoke, flue gases and products of combustion when said secondary damper system means is in its said open position, said secondary damper system means in its said closed position indirectly exhausting to said flue means the smoke, flue gases and products of combustion, said secondary damper system means having a damper plate and two angle irons, said damper plate being flat and of rectangular configuration, said damper plate having a top side, a bottom side, a front edge, a rear edge and lateral sides, said main body cylindrical wall having an inner wall fixedly carrying said two angle irons the full length of said inner cylindrical wall, said two angle irons being horizontally disposed and in parallel relationship with each other, said two angle irons freely carrying and tracking thereon said lateral sides of said damper plate in sealing relationship therewith, in said open position of said secondary damper system means said front edge of said damper plate being engaged in sealing relationship with said inner front wall of said combustion chamber,



in said closed position of said secondary damper system means said rear edge of said damper plate being engaged in sealing relationship with said inner rear wall of said combustion chamber, said open position of said secondary damper system means providing a draft area defined by said rear edge of said damper plate, said inner rear wall of said combustion chamber and said angle irons, said closed position of said secondary damper system means providing a draft area defined by said front edge of said damper plate, said inner front wall of said combustion chamber and said angle irons, said draft areas in said open and closed positions of said secondary damper system means being equal, said draft area in said closed position of said secondary damper system means being greater than, and thereby more effective than, the draft area of said flue means, said secondary damper system means in its said closed position forcing the heat, smoke, flue gases and products of combustion to take a serpentine path first beneath said damper plate towards the front of said heating device and then a 180° curved path in a reverse direction over said top side of said damper plate and then out said flue means with said damper plate and angle irons thereby serving to trap and transfer the greatest amount of heat while maintaining the temperature of the exhausting flue gases above the critical creosote deposition temperature.

4,440,146

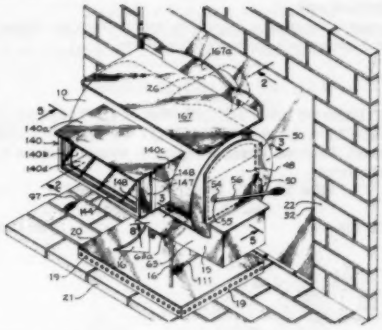
STOVE

Vincent Audino, Jr., and William P. Russ, both of P.O. Box 18668, San Jose, Calif. 95158

Filed Feb. 23, 1981, Ser. No. 237,490

Int. Cl.³ F24C *1/14*

U.S. Cl. 126—77 **10 Claims**



1. In a stove having a housing defining a combustion chamber in which fuel is burned, means for supplying combustion air, and air distribution means for receiving air from said supply means and directing it into the combustion chamber, said air supply means including a plenum chamber having two separate non-communicative compartments and said air distribution means includes a plurality of elongated distribution headers disposed longitudinally in the combustion chamber, each header being divided into two non-communicating sections, and means for directing the air from each of said plenum compartments into a separate one of the sections of a particular header for guidance into the combustion chamber independently of the passage of air from said plenum chamber into the other section of that header.

4,440,147

ROOM-HEATING STOVE WITH A RETRACTABLE FIRE-PREVENTION SPACER

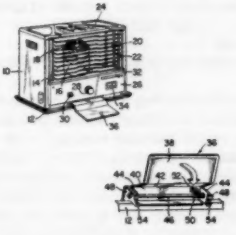
Kazunori Amano; Bunji Aizawa; Akio Ibe, and Yoichi Sekikawa, all of Niigata, Japan, assignors to Toshiba Netsukigu Kabushiki Kaisha, Nigata and Shin Toa Koeki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 6, 1982, Ser. No. 395,713

Claims priority, application Japan, Jul. 10, 1981, 56-102491[U]

Int. Cl.³ F24C *15/36*

U.S. Cl. 126—201 **6 Claims**



1. A room-heating stove comprising:
(a) a body adapted to stand on a floor;
(b) means in the body for producing heat directed forwardly of the body;
(c) a safety spacer mounted on the bottom end of the body,

on its front side, for pivotal motion between a recumbent working position, for holding any external object a safe distance away from the body so as not to be burnt by the heat-producing means, and an upstanding retracted position for saving space when the stove is packaged, the safety spacer being largely in the shape of a flat plate so as to be held flat against the floor when in the working position; and

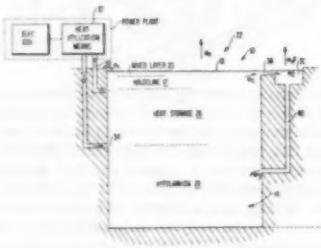
(d) means for urging the safety spacer from the retracted position toward the working position.

4,440,148

METHOD OF AND MEANS FOR MAINTAINING A HALOCLINE IN AN OPEN BODY OF SALT WATER

Gad Assaf, Rehovot, Israel, assignor to Solmat Systems Ltd., Yavne, Israel

Filed Mar. 27, 1980, Ser. No. 134,658
Int. Cl.³ F24J 3/02
U.S. Cl. 126—415 **36 Claims**



1. A method for maintaining a halocline in an open body of salt water at a depth to which a significant amount of solar radiation penetrates, said method comprising the step of inducing an upward vertical flow across the halocline to counter the effects of wind-mixing and molecular diffusion.

14. Apparatus comprising:

(a) a halocline adjacent to the surface of a solar pond for absorbing solar radiations;

(b) a heat storage layer below the halocline for absorbing heat produced in the halocline;

(c) means for automatically stabilizing the halocline including means for inducing an upward vertical flow across the halocline.

4,440,149

RADIATION COLLECTORS

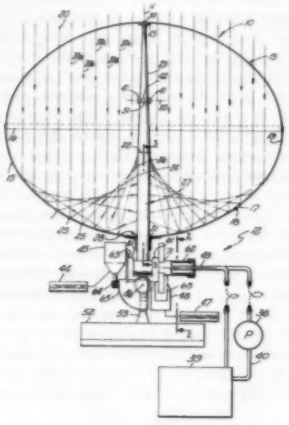
Mark Hattan, Orange, Calif., assignor to William P. Green, Pasadena, Calif., a part interest

Filed Dec. 1, 1980, Ser. No. 211,514
Int. Cl.³ F24J 3/02
U.S. Cl. 126—425 **6 Claims**

1. A collector for receiving radiation from a source, comprising:

an inflatable flexible bag extending generally circularly about an axis to be directed toward said source, and having a front wall of radiation passing flexible sheet material curved essentially annularly about said axis and convexly toward said source through which said radiation may pass to the interior of the bag, said bag having a rear wall of flexible sheet material curved generally annularly about said axis and concavely with respect to said source with a specularly radiation reflective concave forward surface acting to reflect radiation in concentrated form generally toward said axis; and

a structure extending generally along said axis within said flexible bag and connected at opposite ends to central portions of said front and rear walls respectively to assist in maintaining the relative orientation of said walls and the shape of the inflated flexible bag;



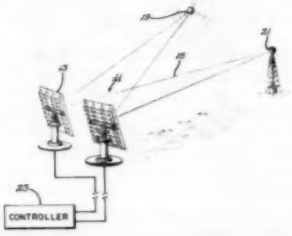
said structure having a collector portion within said bag and between said flexible front and rear walls for receiving radiation concentrated by said reflective rear wall.

4,440,150

HELIOSTAT CONTROL

James A. Kaehler, Littleton, Colo., assignor to Atlantic Richfield Company, Inc., Dallas, Tex.

Filed Jan. 25, 1982, Ser. No. 342,155
Int. Cl.³ F24J 3/02
U.S. Cl. 126—425 **2 Claims**



1. In a heliostat control system including:

a. a target collector for collecting solar energy and converting it into usable energy;

b. at least one supported heliostat, each said heliostat being movable by respective motors in azimuth and elevation for reflecting the solar energy onto said collector;

the improvement comprising a central computer handling external data processing, communication and control, and a plurality of respective heliostats and a plurality of respective heliostat microprocessors, one at each heliostat, each being connected to said central computer and handling for its respective heliostat internal data processing, communication, and direct control of its respective azimuth and elevation stepper motor of elements f and g hereinafter; said central computer and each respective microprocessor at each respective heliostat including respective routines that effect communicating and coaction such that there are provided the following system elements;

c. monitor means for monitoring a current position of a respective said heliostat;

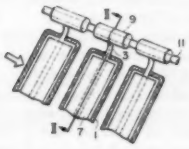
d. computer means for computing a commanded position for a respective said heliostat to be at a particular time of day;
e. cumulating means for determining commanded number of steps for respective stepper motors in each of azimuth and elevation to reach the commanded position;
f. respective azimuth stepper motors connectable with a source of power;
g. respective elevation stepper motors connectable with a source of power;
h. energizer means for energizing respective said stepper motors; said energizer means being connected with said cumulating means and said stepper motors and adapted to operate selectively both and thereafter either of said stepper motors for a given heliostat; and
i. comparison means for comparing accumulated steps to commanded steps; said comparison means being connected with elements c, d, e, and h and being adapted to stop both said motors a predetermined number of steps away from said commanded number of steps to allow deceleration from slewing speeds such that the closest motor reaches its commanded position, and thereafter energizing the remaining motor to attain its commanded position and stop at a predetermined number of steps away from its said commanded position.

4,440,151

SOLAR HEAT COLLECTOR

Takanobu Yamamoto, Katsuta; Isao Sumida; Moriaki Tsukamoto, both of Tohkai; Kazutake Imani, Katsuta, and Naohisa Watahiki, Mito, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,542
Claims priority, application Japan, Dec. 29, 1980, 55-188491
Int. Cl.³ F24J 3/02
U.S. Cl. 126—433 **16 Claims**



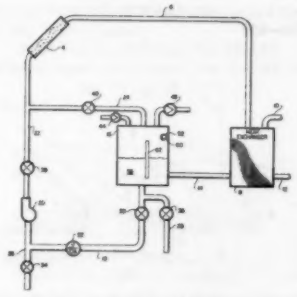
1. A solar heat collector comprising:
a solar heat collection section having an evacuated transparent housing,
a heat collection plate, disposed in said evacuated transparent housing, for receiving solar heat, and
a heat pipe disposed in said housing to receive heat from said heat collection plate and containing an evaporative working liquid therein to be evaporated by the solar heat
a condensation section having
an axially extending heat medium pipe for containing heat medium pipe for containing heat fluid medium to be heated,
heat releasing means of heat-conductive material provided in said heat medium pipe, said heat releasing means extending in the axial direction of said heat medium pipe and having a plurality of thin fin portions, each extending radially from contact with the inner face of said heat medium pipe to about the axis of said heat medium pipe and each extending in the axial direction of said heat medium pipe to form a plurality of peripherally spaced axially extending compartments along the heat medium tube for unobstructed axial passage of said heat fluid medium, and
a casing communicating with said heat pipe and surrounding coaxially said heat medium pipe with an annular space therebetween containing the vapor and condensate of said working liquid in contact with the outer face of said heat medium pipe, so that heat exchange between the vapor and condensate of said working liquid in said casing and the heat fluid medium in said heat medium pipe is effected through said heat medium pipe and said heat realeasing means.

4,440,152

ZERO GAUGE SOLAR SYSTEM

James A. Leflar, and Phillip C. Stanwood, both of Fort Collins, Colo., assignors to Western Solar Products, Inc., Fort Collins, Colo.

Filed Oct. 26, 1981, Ser. No. 314,953
Int. Cl.³ F24J 3/02
U.S. Cl. 126—435 **6 Claims**



1. A nonpressurized solar heating system comprising
solar collector means for heating a heat transfer fluid flowing therethrough,
means for delivering fluid heated by the solar collector means to a heat exchanger,
a fluid expansion tank for receiving fluid through an inlet from a heat exchanger, said inlet being located near the bottom of the tank, and for delivering fluid through an outlet, said outlet being located near the bottom of the tank, said tank including a closable opening through which fluid may be initially introduced into the tank, said opening being located near the top of the tank,
pump means located generally below the level of the tank for pumping fluid received thereby,
first conduit means for supplying fluid from the outlet of the tank to the pump means,
second conduit means for conveying fluid from the pump means to the solar collector means,
a heat transfer fluid disposed in the solar collector means, in the delivery means, in the tank above the inlet and outlet, in the pump means, and in the first and second conduit means, said fluid being placed in said tank under substantially no pressure and having a boiling point of about 550° F. at atmospheric pressure, a boiling point exceeding about 400° F. at about 30 feet of liquid vacuum, and a freezing point below −100° F.,
first valve means disposed in the second conduit means which may be selectively closed to prevent the flow of fluid or open to allow the flow of fluid,
outlet conduit means coupled to the first conduit means and through which fluid may flow to drain or fill the system,
second valve means disposed in the outlet conduit means which may be selectively opened to allow the flow of fluid or closed to prevent the flow of fluid,
third conduit means coupled to the tank at or near the top thereof and to the second conduit means to allow the flow of air therebetween,
third valve means disposed in the third conduit means which may be selectively closed to prevent the flow of air in the

third conduit means, or opened to allow the flow of air, and

fourth valve means disposed in the first conduit means between the connection of the conduit means and the tank, said fourth valve means being selectively closable to prevent the flow of fluid or openable to allow the flow of fluid.

4,440,153

SOLAR CONCENTRATOR

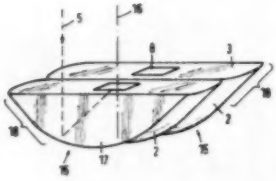
Bernd Melchior, Remscheid, Fed. Rep. of Germany, assignor to Imchemie Kunststoff GmbH, Wermelskirchen, Fed. Rep. of Germany

Filed Mar. 1, 1982, Ser. No. 353,387

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107888

Int. Cl.³ F24J 3/02

U.S. Cl. 126—438 **12 Claims**



1. A solar concentrator comprising at least one solid block of a transparent material having a planar incident surface and a curved reflective surface opposite said incident surface with said material completely filling the space between said surfaces whereby said surfaces bound said block, and an absorber in contact with said block at said incident surface, said absorber obstructing only a portion thereof, such that said incident surface intercepts solar rays which traverse said block, and said reflective surface being at least partly parabolical to reflect rays traversing said block to said absorber whereby said solar rays traverse only material of said block between said incident surface and said absorber.

4,440,154

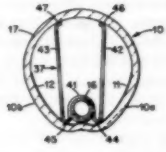
SOLAR ENERGY COLLECTING APPARATUS

Alfred H. Bellows, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 25, 1982, Ser. No. 392,109

Int. Cl.³ F24J 3/02

U.S. Cl. 126—438 **3 Claims**



1. Solar energy collecting apparatus comprising an elongated sealed envelope having side walls extending longitudinally parallel to the principal axis of the envelope;

an elongated energy absorber disposed within said envelope parallel to said principal axis;

a longitudinally extending radiant energy entrance aperture in said envelope for permitting the passage of radiant energy therethrough into said envelope;

reflective surfaces extending longitudinally within said envelope for accepting radiant energy passing through said entrance aperture and reflecting it so as to impinge on said energy absorber;

said reflective surfaces being formed by a reflective coating on the inner surfaces of portions of the side walls of the envelope, and said reflective surfaces having a compound parabolic contour in a plane transverse to said principal axis;

locating means for supporting the energy absorber within the envelope substantially at the focus of the parabolas including a resilient support member of thin wire of uniform diameter;

the support member having a coil closely encircling said energy absorber the internal diameter of the coil in a relaxed state tending to be smaller than the external diameter of the energy absorber, a first arm extending from the coil and bearing against the inner surfaces of the side walls of the envelope at first and second spaced apart contact regions, and a second arm extending from the coil and bearing against the inner surfaces of the side walls of the envelope at third and fourth spaced apart contact regions;

said first arm of said support member including a first reverse bend portion at one end thereof adjoining said coil at one side thereof; and

said second arm of said support member includes a second reverse bend portion at one end thereof adjoining said coil at the opposite side thereof;

the outer surface of said first reverse bend portion bearing against the inner surface of the side walls of the envelope at said first contact region;

the outer surface of said second reverse bend portion bearing against the inner surface of the side walls of the envelope at said third contact region;

said outer surfaces of the first and second reverse bend portions bearing against the first and third contact regions, respectively, at said reflective surfaces adjacent to the low points of the parabolas;

said first arm being generally straight along the major portions of its length from said reverse bend portion at said one end to the other end thereof;

said second arm being generally straight along the major portion of its length from said reverse bend portion at said one end to the other end thereof,

said other ends of said first and second arms being biased apart thereby urging said other ends of the first and second arms against the inner surfaces of the side walls of the envelope at said second and fourth contact regions, respectively, at said radiant energy entrance aperture and urging said outer surfaces of said first and second reverse bend portion against said first and third contact regions, respectively, at said reflective surfaces.

4,440,155

SOLAR CONCENTRATING LENS AND RECEIVER

Ralph P. Maloof, Calabasa, and Roger R. Reynolds, Jr., Costa Mesa, both of Calif., assignors to Reynolds & Taylor, Inc., Santa Ana, Calif.

Filed Jul. 17, 1981, Ser. No. 284,514

Int. Cl.³ F24J 3/02

U.S. Cl. 126—440 **22 Claims**

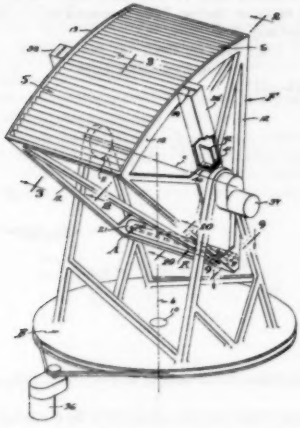
1. A solar concentrating lens and receiver operable in alignment with incoming sunlight, and including;

a multiplicity of parallel transparent elongated slats spaced apart in an array for the passage of light and to ventilate therebetween for reducing wind resistance, and each slat being of basic prism cross section with its apex disposed outwardly from a projection plane aligned with the incoming sunlight,

an elongated receiver longitudinally coextensive with and spaced from the array and on said projection plane in parallel relation to each of the slats,

and each of the slats having upper and lower sides inwardly divergent from its apex and angularly related for projection of the incoming sunlight through the slats and into the

receiver, and having a base faced toward the projection plane and angularly disposed for reflection of the incoming sunlight through the spaces between the slats and into the receiver.

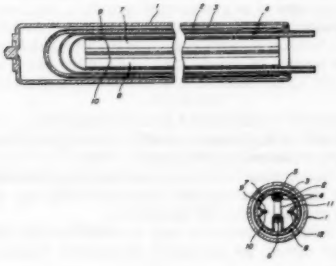


4,440,156

SOLAR HEAT COLLECTOR

Hirosato Takeuchi, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1982, Ser. No. 395,467
Claims priority, application Japan, Jul. 6, 1981, 56-100331[U]
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—443 **7 Claims**



1. A solar heat collector of the evacuated double-tubing type comprising:

an outer substantially straight tube being closed at one end and open at the other end;

an inner substantially straight tube of a lesser diameter relative to said outer tube, being closed at one end and open at the other end;

said inner and outer tubes being hermetically sealed at their open ends with the space therebetween being evacuated to a predetermined degree of vacuum;

a solar heat-absorbing film disposed over the outer surface of said inner tube;

a substantially U-shaped hairpin pipe for circulation of fluid media and including substantially straight pipe portions being positioned inside said inner tube with both opposing substantially straight pipe portions being in contact with the inner surface of said inner tube; and

a pair of heat-conducting members inserted in said inner tube and being brought into surface contact with the inner surface thereof;

said pair of heat-conducting members being of a generally semicircular shape in cross section and each including a groove disposed substantially in a central portion thereof designed to come in surface contact with said straight pipe sections of said hairpin pipe;

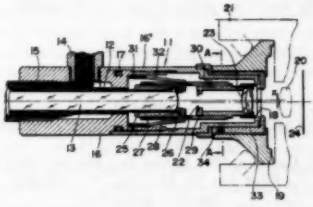
said pair of heat-conducting members having their both lateral sides comprised of inclined portions for bringing their outer surfaces into resilient surface contact with the inner surface of said inner tube and flat portions designed to be in surface contact with each other.

4,440,157

HARD ENDOSCOPE

Yoshio Shishido, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1982, Ser. No. 344,952
Claims priority, application Japan, Feb. 3, 1981, 56-14545
Int. Cl.³ A61B *1/04*
U.S. Cl. 128—6 **5 Claims**



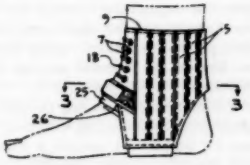
1. In a hard endoscope having an outer tube and an observing optical system fixed therein through which an image may be observed, said optical system defining an observing optical axis, and an eyepiece frame having an inner surface and an outer periphery, said eyepiece frame mounted on said outer tube substantially concentric with said observing optical axis for removably supports a photographing device having a photographing optical axis for photographing through said observing optical system, wherein eccentricity may occur between said photographing optical axis and said observing optical axis, the improvement comprising eccentricity controlling means forming a part of said eyepiece frame for adjustably positioning said photographing optical axis with respect to said observing optical axis.

4,440,158

ANKLE SUPPORTER

Martin Shapiro, Park City West Apts., Apt. 2-0, 3900 Ford Rd., Philadelphia, Pa. 19131

Filed Jun. 8, 1982, Ser. No. 386,248
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 H **1 Claim**



1. An ankle supporter comprising substantially coextensive inner and outer plies of inelastic flexible material having parallel slits forming mutually registering flaps extending in the plies

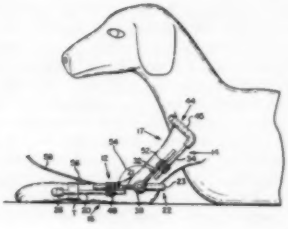
from the upper edges thereof substantially to portions adapted to underlie the instep of the wearer's foot, a unitary body of flexible elastic sheet material interposed between the plies and stitching securing the flaps of the inner ply respectively to the flaps of the outer ply in embracing relation to said elastic material, and stitching being inwardly spaced from the edges of the slits and the elastic material bridging the slits when in unstretched condition maintaining adjacent slit edges in mutual engagement and extending between spaced opposed rear edges of the plies, each of the latter having a series of holes adjacent its front edge for reception of lacing for holding said edges in predetermined relation, an adjustable strap comprising separable parts respectively secured to the supporter adjacent each said series of holes adapted to overlie that portion of the supporter proximate the upper front region of the wearer's instep and malleolus ligament supporting means comprising elastic straps secured to the plies extending angularly forward from said opposed rear edges and adapted to overlie said malleolus ligaments when the supporter is being worn and cooperative means carried respectively by said straps for adjustably and releasably securing to each other the free ends of the straps to apply inward pressure against said ligaments to inhibit dislocation of the malleolus joints or the wearer's ankle.

4,440,159

VETERINARY APPLIANCE FOR USE ON A FRONT LEG OF A SMALL ANIMAL

Phillip E. Cochran, 4965 Barger Dr., Eugene, Oreg. 97402

Filed Jun. 29, 1981, Ser. No. 278,982
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—84 R **9 Claims**



1. A veterinary appliance for use on a selected front leg of a small animal, such as a canine or feline, comprising:

brace means adapted to be detachably mountable on the leg for limiting the extent to which the ulnar portion of the leg may be bent towards its associated humeral portion and for permitting substantially unconstrained movement of the leg to an extended position,

said brace means including a first section mountable on the ulnar portion and a second section connected thereto configured to engage the humeral portion and transfer a reactive force to said first section and correspondingly to the ulnar portion to prevent further bending of the ulnar portion toward the humeral portion after bending to a predetermined angular position,

said first section further including elongate means affixed to the ulnar portion including retaining means provided thereon for positioning around a posterior part of the humeral portion above the olecranon of the leg, and

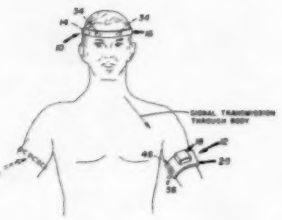
said second section including engagement means configured for abutting against an anterior part of the humeral portion when the ulnar portion has been bent, relative to the humeral portion, to said predetermined angular position.

4,440,160

SELF-INJURIOUS BEHAVIOR INHIBITING SYSTEM

Robert E. Fischell; Glen H. Fountain, and Charles M. Blackburn, all of Silver Spring, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Jan. 19, 1982, Ser. No. 340,753
Int. Cl.³ A61N *1/38*
U.S. Cl. 128—132 R **8 Claims**



1. An apparatus for inhibiting self-injurious behavior, comprising:

at least one sensor module, adapted to be mounted on any of patient's body members, each of said at least one sensor module being mounted on a different body member, and each of said at least one sensor module including,

(a) an accelerometer which detects an acceleration due to a physical impact of said body member,

(b) a "one-shot" circuit connected to and activated by said accelerometer to produce a constant signal for a set period of time,

(c) a clock which provides timing pulses,

(d) a transmitter, connected to and activated by said "one-shot" circuit, which receives timing pulses from said clock and produces an electromagnetic signal,

(e) an interrogatable event counter, connected to said clock and said "one-shot" circuit, to count and record the number of physical impacts; and,

a stimulation module, adapted to be mounted on said patient's body at a location remote from said at least one sensor module, communicating by a wireless link to said at least one sensor module, said stimulation module including,

(a) a signal detecting and demodulating circuit, which provides a triggering signal after detecting and identifying said electromagnetic signal,

(b) a "set-on time" circuit, connected to and actuated by said signal detecting and demodulating circuit, which sets the time period of stimulation,

(c) a means connected to and activated by said "set-on time" circuit, for generating an aversive electric current,

(d) stimulation electrodes, connected to said means for generating an aversive electric current, which conduct said aversive electric current to the skin of said patient's body,

(e) a clock to provide timing pulses, and

(f) an interrogatable event counter, connected to said clock and said means for generating an aversive electric current, to count and record the number of times said aversive electric current is generated.

4,440,161

MULTIPURPOSE NASAL AIRWAY

Rajinder K. Wadhwa, 2482 Mt. Royal Rd., Pittsburgh, Pa. 15217

Filed Sep. 1, 1981, Ser. No. 298,501
Int. Cl.³ A61M *25/00, 15/06, 15/08;* **A61B** *17/32*
U.S. Cl. 128—202.13 **13 Claims**

1. A nasal airway comprising a tubular housing having a first threaded portion adjacent a first end thereof,

an airway tube having a threaded end and a free end insertable into a patient's nostril,
said airway tube received within said tubular housing in a storage position,
said airway tube, when in said storage position, having said free end within said tubular housing and said threaded end being threadedly secured to said first threaded portion of said tubular housing,
first closure means removably covering said first end,
said tubular housing having a second end,
second closure means removably covering said second end,
tracheotomy blade means operably connected to said second closure so as to be disposed within said second end of said housing whereby removal of said second closure from the

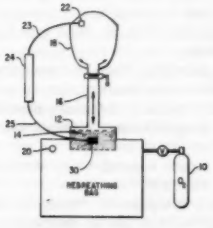
second end of said housing will permit separation of said tracheotomy blade, means from said housing for use,
writing means having a supply of material to be deposited during writing extending into said airway tube and being removably secured to the threaded end of said airway tube and having a material discharge end underlying said first closure means, whereby removal of said first closure means, said second closure means and said writing means from said tubular housing will permit separation of said airway tube from said housing and threaded attachment of said airway tube threaded end to said housing first threaded end with said airway tube free end disposed exteriorly of said housing to create a nasal airway consisting of said housing and said airway tube.

4,440,162

SODA LIME HALF LIFE INDICATOR

Richard B. H. Sewell, Victoria; Lannie K. Yee, Saanichton, and Robert W. Chappell, Victoria, all of Canada, assignors to Her Majesty the Queen in right of Canada, Canada

Filed Jun. 23, 1981, Ser. No. 276,519
Int. Cl.³ A62B 7/08
U.S. Cl. 128—202.22 **15 Claims**



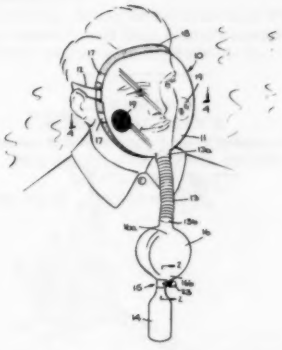
7. In a closed circuit underwater breathing apparatus, comprising
a breathing tube through which a diver may inhale and exhale breathing gas;
a re-breathing bag;
a canister containing a CO_2 absorbent selected from the group consisting of soda lime and other suitable non-toxic alkali and alkaline earth metal hydroxides, disposed between said breathing tube and said re-breathing bag, such that fluid communication from said re-breathing bag to said breathing tube is achieved through said cannister wherein an exothermic reaction occurs when exhaled gas is passed therethrough;
inlet means in said re-breathing bag;
a breathing gas reservoir;
gas conduit means for fluid communication between said inlet means and said breathing gas reservoir;
one-way valve means in said gas conduit means to permit breathing as flow from said breathing gas reservoir to said re-breathing bag;
blow-off valve means connected with said re-breathing bag to permit pressure equalization, the inprovement comprising providing an indicator comprising;
temperature sensing means immersed in said absorbent for sensing the temperature of the temperature cycle of the heat generated by the chemical reaction of the hydroxide and CO_2, said temperature cycle including a rise, a levelling off and a fall in temperature;
temperature to voltage converter means for converting said sensed temperature to an electrical voltage signal;
temperature trend processing means for processing said electrical voltage signal into a selected electrical output signal characteristic of said rising, levelling off and falling temperature trend and indicative of the present effectiveness of the CO_2 absorbent; and
display means for converting said selected electrical output signal to a predetermined visual display indicative of a first indication of said rising, a second indication of said levelling off and a third indication of said falling temperature and wherein each said first, second and third indications being visually unique and materially different from one another and thereby indicating the capacity of the CO_2 absorbent to absorb CO_2.

4,440,163

EMERGENCY ESCAPE BREATHING APPARATUS

Gabriel Spergel, 1806 Ditmas Ave., Brooklyn, N.Y. 11226

Filed Jul. 30, 1982, Ser. No. 403,713
Int. Cl.³ A62B 7/02
U.S. Cl. 128—205.13 **5 Claims**



1. In an emergency escape and throw-away breathing apparatus adapted to be supported by and freely depend from the head of the wearer, the improvement comprising in combination:
(a) a convexly-curved mask having head band means for attachment around the head of the wearer and of relatively rigid and transparent plastic to form a sealed chamber with the face of the wearer and being adapted to receive a breathable atmosphere containing elemental

oxygen and having pressure-relieving valve means in the mask communicating with the ambient atmosphere;

(b) a breathable atmospheric source comprising a pressurized container of an elemental oxygen-containing gas;

(c) a gas flow control assembly connected thereto and in axial alignment therewith and including a pressure-reducing, stress-resisting and regulating gas reservoir bag having an inlet at the lower axial end and an outlet at the axial top, and further including a valve structure at the lower axial end affixed to and normally closing gas flow from the mouth of said pressurized container and at the upper axial end affixed and for gas flow to the inlet of said reservoir bag so as with said container to present a fixed, permanently open and straight gas flow path, said valve structure including rupturable valve closure means therewithin and external and visible finger-accessible and finger-engagable operating means intermediate the gas container and said reservoir bag and adapted to serve as the operative element for rupture of said valve closure means for valve opening and gas feed to said inlet of the reservoir bag; and

(d) a flexible and kink-proof hose section connecting said face mask adjacent the lower axial end thereof to said reservoir bag at the outlet thereof and adapted to feed gas into the said gas mask chamber, said kink-proof hose section serving to act as a yieldable folding area when the apparatus is in inoperative and folded and stored position whereby the gas flow-path retains its open and unrestricted condition, said kink-proof hose section further serving to act when the apparatus is operational so as to render the gas flow path yieldable to override ensnaring obstacles during wear and also to contribute to the unidirectional and substantially straight-line gas flow-path to the mask and to the substantially incompressible structure of said flow path.

4,440,164

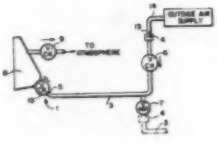
LIFE SUPPORT SYSTEM AND METHOD OF PROVIDING FRESH AIR TO ENCLOSED AREAS

Bertil Werjefelt, 277 Kaha St., Kailua, Hi. 96734

Continuation-in-part of Ser. No. 73,612, Sep. 10, 1979, and a continuation-in-part of Ser. No. 185,962, Sep. 10, 1980. This application Jan. 27, 1981, Ser. No. 228,940

Int. Cl.³ A62B 7/00

U.S. Cl. 128—205.25 **18 Claims**



1. A life support system adapted for use in an aircraft having a pressurized cabin and an air supply system for conducting air from the exterior of said aircraft to the cabin within said aircraft, and wherein said air supply system includes at least one gasper outlet fluidically communicating with said cabin, said life support system comprising:

(a) a mask adapted to be placed over at least one breathing cavity of a user, said mask comprising a temperature-resistant and fire-resistant material adapted to prevent noxious cabin fumes from entering said mask; and

(b) connecting means including a first hose having one end attached to said mask, and another end comprising means adapted to be fluidically connected to a gasper outlet, said system comprising a supplemental air container attached to said hose, said container comprising means for receiving air from a gasper outlet and for retaining said air when said hose is separated from a gasper outlet in order to form a portable air source for a user, said mask and connecting means comprising means for directing said exterior air to said breathing cavity and for preventing the introduction of ambient air from said cabin into said cavity.

4,440,165

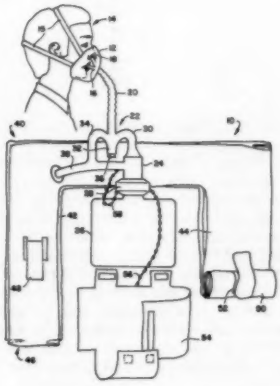
CLOSED-CIRCUIT BREATHING APPARATUS

Thomas M. Holzel, 52 Lang St., Concord, Mass. 01742

Filed Mar. 1, 1982, Ser. No. 353,838

Int. Cl.³ A62B 7/00

U.S. Cl. 128—205.28 **16 Claims**



1. A closed-circuit breathing apparatus comprising

A. an air-purification element, having an inlet and an outlet, for permitting the flow of air through it from its inlet to its outlet and for reducing the carbon dioxide content and increasing the oxygen content of the air passing through it;

B. reservoir means for storing oxygen-enriched air, said reservoir means being adapted to be opened from a closed state, in which it stores oxygen-enriched air, to an open state, in which it provides an opening large enough to permit a user to insert his hand into the interior of the reservoir means;

C. means for providing fluid communication between the outlet of said air-purification element and the interior of said reservoir means and thereby permitting air to flow from said air-purification element into said reservoir means;

D. facemask means adapted to fit over the nose and/or mouth of a user; and

E. conduit means separately connected to said facemask means, to said inlet of said air-purification element, and to the interior of said reservoir means, said conduit means including:

(1) an exhaust flow passage for providing fluid communication between said facemask means and said inlet of said air-purification element; and

(2) an intake flow passage for providing fluid communication between the interior of said reservoir and said facemask means, said intake flow passage including at

least a portion thereof that is separate from said exhaust flow passage, said separate portion including an intake check valve therein for permitting the flow of air from said reservoir to said facemask but not from said facemask to said reservoir.

4,440,166

ELECTRICALLY AND MECHANICALLY CONTROLLABLE CLOSED CIRCUIT RESPIRATOR

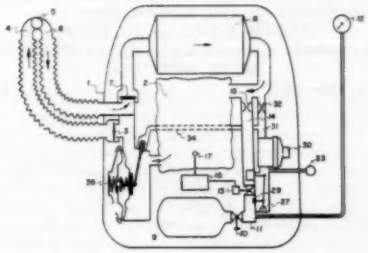
Jörg Winkler, Stockelsdorf; Hans Matthiessen, Gross Parin; Ernst Warncke, Lübeck, and Adalbert Pasternack, Bad Schwartau, all of Fed. Rep. of Germany, assignors to Dräger-werk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 357,335

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109660

Int. Cl.³ A62B *7/10*

U.S. Cl. 128—204.22 **8 Claims**



1. A closed circuit respirator comprising:

a breathing bag having an inlet and an outlet, a carbon dioxide absorber having an inlet and an outlet, a junction adapted for engagement by a user having an inlet and an outlet, conduit means connecting the outlet of said junction to the inlet of said carbon dioxide absorber, the outlet of said carbon dioxide absorber to the inlet of said breathing bag and the outlet of said breathing bag to the inlet of said junction to define a closed respiration air circuit;

a pressurized oxygen supply container connected to said air circuit for supplying oxygen to said air circuit;

a normally closed controllable valve connected between said oxygen supply container and said air circuit with sensing and control means for sensing oxygen in said breathing bag and opening said controllable valve with reduced oxygen in said bag;

means defining a high-pressure pressure chamber connected between said container and said controllable valve upstream of said controllable valve and a medium pressure chamber connected between said air circuit and said controllable valve downstream of said controllable valve;

means defining a pre-pressure chamber connected between said high-pressure chamber and said air circuit;

a further valve having a valve member connected between said pre-pressure chamber and said high-pressure chamber and movable for opening said pre-pressure chamber to said high-pressure chamber;

a cylinder connected to said medium pressure chamber;

a biased piston movable in said cylinder and dividing said cylinder into first and second compartments, said first compartment communicating with said medium-pressure chamber, said second compartment communicating to atmosphere, biasing means for moving said piston toward said first compartment with the occurrence of a reduced pressure in said medium pressure chamber due to a failure of said sensing and control means which closes said controllable valve; and

lever means connected between said piston and said valve member to move said valve member to open the connection between said high-pressure chamber and said pre-pressure chamber when said piston moves toward said first compartment caused by said reduction in pressure in said medium-pressure chamber and to close when said piston moves toward said second compartment caused by an increased pressure in said medium-pressure chamber.

4,440,167

ANESTHETIZER FOR DENTAL TREATMENT

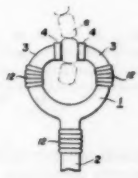
Shigeru Takehisa, Tokyo, Japan, assignor to Kabushikikaisha Yoshida, Tokyo, Japan

Filed Dec. 4, 1981, Ser. No. 327,472

Claims priority, application Japan, Dec. 26, 1980, 55-186503[U]

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.1 **4 Claims**



1. An anesthetizer for dental treatment comprising:

a hollow tubular anesthetizer body consisting of a tube branched into a pair of branch tubes having ends opposing to each other;

a gap of a predetermined distance being positioned therebetween for placing said pair of branch tubes on each side of a single tooth, gum area;

caps detachably fitted on opposing ends of the branch tubes;

plate-type thermoelectric elements secured to free ends of the caps so as to form the top surfaces of respective caps, each thermoelectric element having a colder surface directed outwardly toward said gap with a warmer surface being confined with said caps;

connecting terminals projected from the branch tubes and being operatively connected to each of said thermoelectric elements; and

fluid conduits for cooling the hotter surfaces of the thermoelectric elements, said fluid conduits extending through said hollow tubular anthetizer body via the branch tubes.

4,440,168

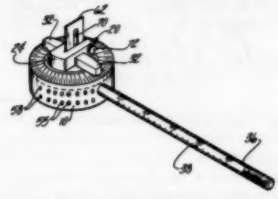
SURGICAL DEVICE

Mark G. Warren, 6584 Cranberry Lake, Clarkston, Mich. 48016

Filed Aug. 31, 1981, Ser. No. 297,870

Int. Cl.³ A61B *17/00*

U.S. Cl. 128—303 B **8 Claims**



1. A bone marking device comprising:

an annular body member having a top, bottom and side surface, said top surface having indicia means thereon,

an elongated handle having a longitudinal axis and extending outwardly from one side of the body,

a member having a slot and rotatably mounted in said body

around an axis substantially perpendicular to the longitudinal axis of said handle, said member having a first axial end and a second axial end,

a marking means slidably mounted in said slot in said rotatable member, said marking means having a curvilinear marking edge, and

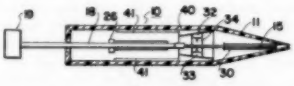
means for retaining said marking means in said slot so that said marking means is axially slidably movable within said slot between predetermined limits.

4,440,169

OPHTHALMIC SURGICAL INSTRUMENT

Melvin L. Schulman, #B1 Cornwall Ct. (Off Cranbury Rd.), East Brunswick, N.J. 08816

Filed Apr. 26, 1982, Ser. No. 371,552
Int. Cl.[3] A61B *17/32*
U.S. Cl. 128—305 10 Claims



1. A surgical instrument particularly adaptable for performing a peripheral iridectomy comprising:

a hollow tubular member having a pointed end portion adapted to pierce solid tissue with a front opening in said pointed end portion,

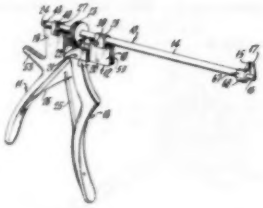
movable tissue grasping means located in the hollow of said tubular member and operative when moved in a first direction to pass through said opening to grasp tissue and when moved in a second direction to draw said grasped tissue through said opening into said hollow of said tubular member, and cutting means located in the hollow of said tubular member and selectively operative to cut said tissue as drawn into said hollow, with said cutting means when selectively operated capable of forming an aperture in said tissue of a diameter according to the distance moved by said tissue grasping means in said second direction, with said cut tissue remaining in said hollow.

4,440,170

SURGICAL CLIP APPLYING INSTRUMENT

Donald Golden, Cherry Hill, and Robert B. Duncan, Bridgewater, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Mar. 6, 1979, Ser. No. 18,073
Int. Cl.[3] A61B *17/12*
U.S. Cl. 128—325 25 Claims



1. A surgical clip applicator comprising

a handle member;

a pair of spaced-apart cradles integral with said handle member at one end thereof;

a trigger member pivotally connected to said handle member and extending into the space between said cradles;

an elongated tubular jaw assembly rotatably mounted on said cradles, said jaw assembly comprising an axially movable tube member having a forward facing jaw on the distal end thereof and a rod member extending through said tube member and having a rearward facing jaw on the distal end thereof;

means on said tube member intermediate said cradles engaging said trigger member;

means on the proximal end of said rod member restraining said rod member from movement in an axial direction while permitting rotation thereof;

means aligning said forward facing and rearward facing jaws, said jaws being axially movable but nonrotatable with respect to each other; and

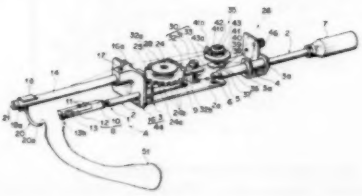
means for rotating said mounted tubular jaw assembly with said jaws in alignment.

4,440,171

SUTURING INSTRUMENT AND A METHOD OF HOLDING A SHUTTLE

Reishi Nomoto; Masayoshi Takahashi, both of Kanagawa, and Yoshikazu Ebata, Tokyo, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Kyobashi, Japan

Filed Feb. 1, 1982, Ser. No. 344,781
Claims priority, application Japan, Apr. 13, 1981, 56-54436
Int. Cl.[3] A61B *17/04*
U.S. Cl. 128—335.5 5 Claims



1. In a surgical suturing instrument having a curved needle carrying a suturing thread and mounted on a needle supporting means and a reciprocally movable shuttle holding means carrying a shuttle to which the suturing thread is connected to form a shuttle thread, the suturing thread being formed into a thread loop through which said shuttle is passed to form in cooperation with said needle, suturing stitches in two parts being sutured up, a combination comprising a shuttle having a said longitudinal center line and being symmetrical relative to said center line, said shuttle including a main body having an upper face and formed with a front end and a rear end, and a front end portion outwardly extending from said front end of the main body, said front end portion being formed with a thread passing hole and having a sharp end catching the thread loop, said front end portion having an upper sloped surface extending between said sharp end and said front end of the main body, and a lower sloped surface extending between said bottom surface and said front end of said main body; and said shuttle holding means including a shuttle holder and a shuttle claw secured to the shuttle holder so as to accommodate said shuttle therebetween, said shuttle holder being formed with a first guide groove engaging to engage and guiding said front end portion of said shuttle, said shuttle claw having a front part and a rear part, said front part having a second guide groove engaging guiding and guide said front end portion of the shuttle, said rear part of said shuttle claw being formed with a pair of opposite shuttle guide pieces which define an inner face of the shuttle claw, said guide pieces and said main body of the shuttle being so dimensioned that clearances are made between the upper face of said main body and the inner face of the shuttle claw, and between the rear end of said main body and said inner face to allow the suturing thread to pass through said clearances, said front end portion moving from said first guide groove to said second guide groove and vice versa, whereby the shuttle carrying the thread is prevented from being slipped

out from said shuttle holding means during the suturing operation.

4,440,172

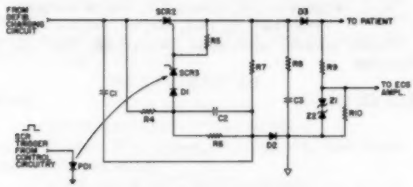
APPARATUS FOR COMBINING PACING AND CARDIOVERTING FUNCTIONS IN A SINGLE IMPLANTED DEVICE

Alois A. Langer, Pittsburgh, Pa., assignor to Mieczyslaw Mirowski, Owings Mills, Md.

Continuation-in-part of Ser. No. 193,027, Oct. 2, 1980, abandoned. This application Dec. 11, 1980, Ser. No. 215,520

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 D **45 Claims**



1. An implantable defibrillation system for implantation in a patient comprising a ground reference, defibrillating means for generating high-voltage defibrillating pulses, an ECG amplifier for sensing cardiac signals, common conductor means electrically connected to both said defibrillating means and said ECG amplifier for transferring both defibrillating pulses and cardiac signals respectively to and from said patient through said ground reference, said defibrillating means being connected to said common conductor means, and interface means being electrically connected to said amplifier and said common conductor means for limiting the voltage applied to said amplifier during the presence of a defibrillating pulse and for transferring a substantial portion of said cardiac signal to said amplifier during the absence of a defibrillating pulse.

4,440,173

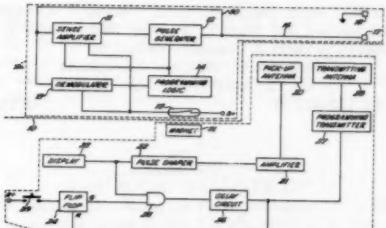
PROGRAMMABLE BODY STIMULATION SYSTEM

Lawrence C. Hudziak, White Bear Lake, and Jerome T. Hartlaub, New Brighton, both of Minn., assignors to Medtronic, Minneapolis, Minn.

Continuation of Ser. No. 92,354, Nov. 8, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,222

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **11 Claims**



1. In a body stimulation system of the type having external means for generating and transmitting radio frequency programming signals and implantable means, the implantable means including signal generator means with at least one programmable operating characteristic and means responsive to received programming signals for establishing said programmable operating characteristic in predetermined correspondence therewith; a housing enclosing said signal generator; and output means for delivering stimulation signals to a desired body site including stimulation delivering lead means extending from said housing, the improvement wherein said lead means comprises means connected to said operating characteristic establishing means for receiving said programming signals.

4,440,174

WOMAN'S GARMENT

Robert A. Cordova, Laguna Hills, Calif., assignor to Kayser-Roth Corporation, New York, N.Y.

Filed Jun. 18, 1981, Ser. No. 274,896

Int. Cl.³ A41B *1/12*; A41C *3/08*

U.S. Cl. 128—455 **10 Claims**

1. A woman's tank top outer garment having an outer shell with a top edge shaped to form a concave neckline, and a plurality of straps for suspending said outer shell from the shoulders of a wearer, said tank top outer garment including an independently suspended shelf bra formed separately from said outer shell for supporting a wearer's bust, said separate shelf bra having a bottom edge and an upper edge, said upper edge being shaped to conform to the concave neckline of said outer shell and affixed to said outer shell along said outer shell top edge only and including two shirred pockets for positioning over the bust of a wearer, said tank top further comprising an elastic band attached at said shelf bra bottom edge so that said shirred pockets and said elastic band act in combination to support the bust of a wearer independent of said tank top outer shell.

4,440,175

MEMBRANE ELECTRODE FOR NON-IONIC SPECIES

Ebtisam Wilkins, Albuquerque, N. Mex., assignor to University Patents, Inc., Norwalk, Conn.

Filed Aug. 10, 1981, Ser. No. 291,737

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—635 **13 Claims**

1. A membrane electrode for use in measuring the concentration of a non-ionic species in an aqueous medium as a function of potentiometric or polarographic response comprising a conductive substrate component and a membrane component layered or coated on said substrate component, said membrane being compatible and non-reactive with the aqueous medium and comprising

(a) a polymeric material;

(b) an anion exchange material; and

(c) a water-insoluble salt of said non-ionic species to be measured.

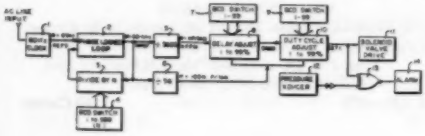
4,440,176
DIGITALLY PROGRAMMABLE CARDIAC SYNCHRONIZED HIGH FREQUENCY JET VENTILATOR CONTROL SYSTEM

Saul Miodownik, New York, N.Y., assignor to Memorial Hospital for Cancer and Allied Diseases, New York, N.Y.

Division of Ser. No. 233,244, Feb. 10, 1981. This application Aug. 9, 1982, Ser. No. 406,600

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—708 **3 Claims**



1. A device for detecting the QRS component of an EKG signal comprising:

a delta modulator receiving the EKG signal and having a slope overload condition defined by the step size and sampling rate thereof such that it goes into the slope overload condition only in response to the QRS component of the EKG signal for detecting the same.

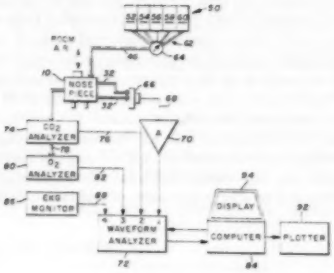
4,440,177
RESPIRATORY ANALYZER SYSTEM

Stephen T. Anderson, and Catherine A. Anderson, both of Stillwater, Minn., assignors to Medical Graphics Corporation, Shoreview, Minn.

Continuation-in-part of Ser. No. 165,949, Jul. 3, 1980, abandoned. This application Dec. 16, 1981, Ser. No. 331,247

Int. Cl.³ A61B *5/08*

U.S. Cl. 128—719 **7 Claims**



1. Apparatus for diagnosing possible brain stem disfunction relating to respiration in a patient comprising:

(a) means for selectively introducing a plurality of known percentages of a test gas into air being inspired by said patient;

(b) means for measuring the inspiratory and expiratory flow of air to and from said patient during time periods related to introduction of each such gas percentage and for developing first electrical signals proportional thereto;

(c) means for measuring the percentage concentration of said test gas in the air expired by said patient during time periods related to introduction of each such gas percentage and for producing second electrical signals proportional thereto;

(d) analyzer means, including a programmable computing means, connected to receive said first and second electrical signals for integrating said first signals over respective predetermined time intervals and for computing from said second signals the respective alveolar partial pressure of carbon dioxide gas in the expiratory air flow from the lungs of said patient, said analyzer means further including means for determining the change in said integrated first signals relative to said respective alveolar partial pressures; and

(e) display means connected to said analyzer means for displaying said relative change, whereby normal and abnormal ventilatory responses may be distinguished.

4,440,178
IMPLANTABLE ELECTRODE

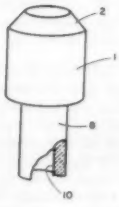
Adrien Bussard, Meierskappel, Switzerland; Fritz Aldinger, Rodenbach, and Franz Sperner, Hanau, both of Fed. Rep. of Germany, assignors to Kontron AG, Zurich, Switzerland and W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 333,944

Claims priority, application Switzerland, Dec. 23, 1980, 9523/80

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—784 **13 Claims**



1. A porous electrode for implanting in organic tissue, comprising a sintered member of electrically conductive particles, said member having

(i) a first surface portion of said sintered particles which is anodized at least at the non-interconnected area of the particles so as to form a relatively thin metal oxide coating on said surface portion and

(ii) a second surface portion coated with an electrically conductive metal inert to body fluids, said two surface portions being configured and adapted for intimate contact with the tissue.

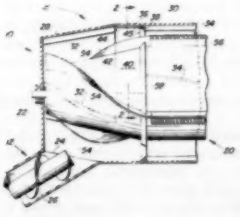
4,440,179
STONE TRAP FOR AN AXIAL FLOW ROTARY SEPARATOR

James H. Bassett, Davenport, Iowa; Timothy F. Christensen, East Moline, and Mark L. Pearson, Moline, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed Oct. 18, 1982, Ser. No. 434,820

Int. Cl.³ A01F *7/00, 12/20, 12/28*

U.S. Cl. 130—27 JT **40 Claims**



1. In an axial flow rotary crop material separator in which a rotor rotates within a casing so as to define an annular space,

the space having an upstream inlet end for receiving harvested crop material, which material may include nonfrangible bodies, and a downstream outlet end for discharging at least a portion of the received material and in which rotor and casing cooperate to propel the received material downstream as a mat in a generally spiral path, the speed of the rotor being sufficient to maintain the mat generally in contact with the casing, a rock control arrangement comprising:

means disposed in the annular space between the inlet and the outlet for arresting the downstream progress of nonfrangible bodies having dimensions greater than a predetermined minimum;

an aperture in the casing adjacent to and at least partially upstream of the means for arresting, for passing said bodies larger than the predetermined minimum; and

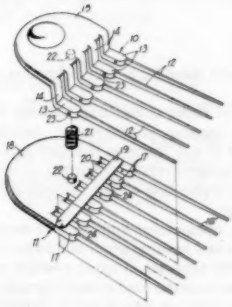
means carried by the rotor for propelling the bodies within the casing to bring them into register with the aperture and release them to pass through the aperture under the action of centrifugal force.

4,440,180

CURL LIFTING COMB OR PICK

Rodney E. Thomas, 3271 Desert Cir., Apt. #1, East Point, Fulton County, Ga. 30344

Filed Aug. 6, 1982, Ser. No. 406,084
Int. Cl.³ A45D *24/00*
U.S. Cl. 132—11 R **7 Claims**



1. A curl treating comb or the like comprising coacting comb sections pivotally connected about an axis, said comb sections having substantially parallel closely interfitting tines on one side of the pivot axis and handle extensions on the other side of said pivot axis, and means resiliently biasing the comb sections to a position where the tines of the comb sections are in an interleaved side-by-side relationship in a common plane, whereby the tines may then penetrate curls and may then be separated to expand the curls by exerting pressure on the handle extension, and a stop element on one comb section to limit relative pivotal movement of the comb sections under influence of the biasing means.

4,440,181

NAIL POLISH REMOVER KIT

John S. Scherer, 1123 Kings Cove Dr., Rochester, Mich. 48063

Continuation-in-part of Ser. No. 222,357, Jan. 5, 1981, abandoned. This application Jun. 18, 1981, Ser. No. 275,114
Int. Cl.³ A45D *29/18*
U.S. Cl. 132—73.5 **18 Claims**

1. A nail polish remover kit comprising, in combination:

a jar having walls which rise from a lower portion to an upper portion said upper portion having an upwardly opening constricted mouth;

a lid for removably sealingly closing the mouth;

a sponge-like filler for insertion in the jar having an upper end which prior to insertion is of greater horizontal cross-sectional area than the corresponding upper portion of the jar and after insertion is compressed inwardly by said upper portion of the jar, said filler having a horizontal cross-section below said upper end which, moving from the lower end, and prior to insertion in the jar, progressively increases relative to the corresponding cross-section of the jar, whereby the upper end of the filler is more highly compacted than the lower end of the filler;

said filler having a centrally arranged finger receiving opening at said upper end extending downwardly through the more densely compacted area and sized to wipe a finger inserted therein; and

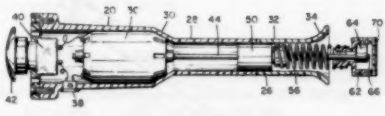
a nail polish remover solution in the jar saturating the filler to wet the nail of a finger inserted in said opening.

4,440,182

SANDER FOR ARTIFICIAL NAILS

Harold K. Holm, 410 W. Harvey, Santa Ana, Calif. 92707

Filed Mar. 21, 1983, Ser. No. 477,145
Int. Cl.³ A45D *29/04*
U.S. Cl. 132—75.6 **19 Claims**



1. A fingernail shaping instrument comprising:

a sanding head;

a head driving unit;

resilient means for mounting the sanding head on the head driving unit such that the head is movable with the head driving unit and is capable of being tilted relative to a line extending between the head and head driving unit; and

means for moving said head orbitally about said line.

4,440,183

ANATOMICAL DEVICE

Jess Miller, Rte. 13, P.O. Box 183B, Fort Worth, Tex. 76119

Continuation-in-part of Ser. No. 110,354, Jan. 7, 1980, abandoned. This application Sep. 16, 1980, Ser. No. 187,486
Int. Cl.³ A61F *5/00*
U.S. Cl. 128—79 **9 Claims**

1. A device for facilitating and maintaining the erection of the penis of a human male, comprising:

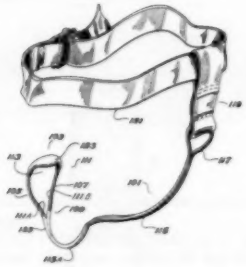
a wire-like closed loop-shaped member adapted to be fitted around and engage at least the dorsal part of the base of

the penis for restricting the flow of blood from the penis to achieve and maintain an erection,

a central portion having a first end coupled to said closed loop-shaped member and extending rearward and upward therefrom to an opposite end,

said central portion constructed from a wire-like material and defining a given non-linear configuration,

said central portion being adapted to be located between the legs of a human male, and



means coupled to said opposite end of said central portion for engaging the hips, waist, or the like for holding said central portion between the legs of a human male and said closed loop-shaped member in place around the penis next to the body,

said central portion being formed of a material sufficient to maintain said central portion in said given non-linear configuration when said central portion is supported at said opposite end.

4,440,184

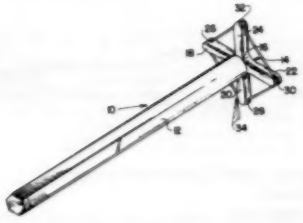
DENTAL FLOSSING DEVICE

Eric L. Smith, 638 Potomac Ave., Hagerstown, Md. 21740

Filed Jun. 25, 1982, Ser. No. 392,136

Int. Cl.³ A61C *15/00*

U.S. Cl. 132—91 **10 Claims**



5. A dental flossing instrument comprising, in combination, an elongated handle,

a generally star wheel shaped floss support head on one end of the handle

said floss support head including a central hub portion and more than two support fingers extending generally radially from said central hub portion and from said handle and being located in substantially equally spaced relation to one another around said hub portion, said fingers each terminating in a free end having a floss retaining groove therein, said floss retaining grooves being disposed in a common plane extending substantially perpendicular to said elongated handle, and a closed loop of dental floss extending around the support head and engaging each said finger within said groove formed in the end thereof, the length of the dental floss in said closed loop in an unstressed condition being slightly less than the distance around said floss support head whereby the closed loop is elastically extended when installed on the floss support head and whereby the portion of the closed loop extending between each adjacent pair of said fingers is supported in position for use in flossing the teeth and is maintained under tension to facilitate such use.

4,440,185

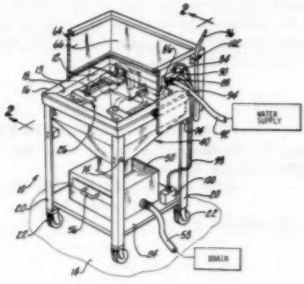
SUPPORT STAND FOR A FOOD SLICER

Dean P. Wiltse, P.O. Box 215, Oscoda, Mich. 48750

Filed Aug. 18, 1982, Ser. No. 409,322

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—104 **9 Claims**



1. A support stand for a food processing apparatus comprising:

a perimeter frame comprising framing members defining a central opening, and having a plurality of support legs secured to said frame so that said perimeter frame is substantially horizontally supported on top of said legs;

means for supporting a food processing apparatus over said opening;

a tubular, open-ended housing and means for slidably entraining said housing about said frame so that said housing is slidable between an upper position in which it substantially encloses the food processing apparatus therein and a lower position in which said housing is positioned below the food processing apparatus;

means for releasably maintaining said housing in said upper position;

means for releasably maintaining said housing in said lower position;

sealing means for providing a watertight seal between said housing and said frame when said housing is in said upper position; and

a drain receptacle having an open top secured below said central opening and means for draining said receptacle.

4,440,186

NONSKID ASSEMBLY FOR PREVENTING THE SLIDING OF AN ITEM

Josef Lottner, Eburonenstrasse 9-11,, D-5000 Koln 1, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 344,153

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1981, 3102868; May 5, 1981, 3117614

Int. Cl.³ A61H *3/02*

U.S. Cl. 135—84 **38 Claims**

1. A nonskid assembly comprising:

(a) a ring element having an upper portion and a lower undersurface with central opening passage extending from the undersurface completely through the ring element,

(b) coupling means partially disposed within said central opening passage and projecting outwardly from said central opening,

(c) retainer means disposed within the central opening passage through said lower undersurface,
(d) said retainer means being effective to support said coupling means against downward displacement within the central opening passage,

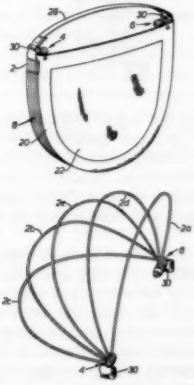
(e) tread carrier means having treads on a bottom surface thereon being connected to the ring element over the lower undersurface of said ring element, and
(f) the retainer means has a plane underside against which the tread carrier means is disposed.

4,440,187

PORTABLE SUN SHELTER

Maurice K. Fiddler, 31 Hygeia Parade, Ringwood, Victoria, Australia

Division of Ser. No. 142,392, Apr. 21, 1980. This application May 10, 1982, Ser. No. 376,488
Claims priority, application Australia, Apr. 23, 1979, PD8509
Int. Cl.³ E04F *10/04*
U.S. Cl. 135—117 **10 Claims**



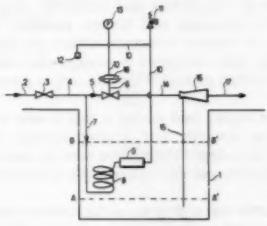
7. A foldable shelter comprising a framework having two joints, first rib, second rib, and a plurality of intermediate ribs each of generally U-shaped configuration, a flexible cover connected to said ribs one end of the cover being connected to the first rib and the other end of the cover being connected to the second rib, one of the ends of each rib being connected at one of said joints and the other of the ends of each rib being connected at the other of said joints, said joints permitting the ribs to be rotatable relative to one another characterized in that at least one of said joints includes a number of rotatable carrier elements in which the ends of the ribs are mounted, said carrier elements being disc shaped and formed from synthetic plastic material and said at least one joint includes spring means to apply resilient axial compressive forces to said rotatable carrier elements whereby said elements function as friction clutch members.

4,440,188

PROCESS AND DEVICES FOR CONTROLLING THE LEVEL OF A LIQUID

Joseph Le Carrou, 7, rue de la Victoire, 76290 Montivilliers, France

Continuation of Ser. No. 138,732, Jul. 27, 1979, abandoned. This application Sep. 2, 1981, Ser. No. 298,643
Int. Cl.³ F17D *1/12*
U.S. Cl. 137—2 **25 Claims**



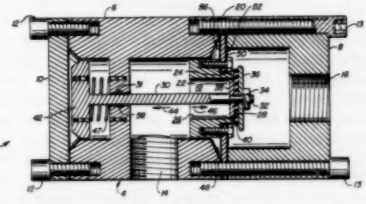
1. A process for controlling the level of a liquid at a temperature t_2 contained in an enclosure, comprising (a) continuously supplying a condenser placed in said enclosure with a fluid which is in a gaseous state under pressure p and at a temperature t_1, greater than the temperature t_2 of said liquid, which will condense to a liquid at said pressure p and at said temperature t_2, such that the fluid in said condenser condenses when the level of the liquid in the enclosure immerses the condenser in the liquid to cause said fluid to approach the temperature t_2, (b) discharging said condensed fluid outside the condenser, (c) sensing said discharge, (d) drawing off the level of the liquid in said enclosure in response to said sensed discharge, (e) sensing when the fluid in said condenser does not condense because the liquid level in the enclosure does not immerse the condenser in the liquid, and (f) increasing the level in said enclosure responsive to said second step of sensing.

4,440,189

CORROSIVE FLUID TWO WAY CHECK RELIEF VALVE

John M. Graham, 921 Sequoia Ave., Millbrae, Calif. 94030

Filed Sep. 4, 1981, Ser. No. 299,365
Int. Cl.³ F16K *17/18*
U.S. Cl. 137—116 **6 Claims**



1. A check relief valve useable with corrosive fluids comprising:
a body;
an input port formed in said body;
an output port formed in said body;
a fluid passageway connecting said input and output ports; and

a flow control means for controlling fluid flow along said fluid passageway, said flow control means adapted to permit substantially free flow of fluid in a forward flow direction, from said input port to said output port, along a control portion of said passageway and for blocking flow of fluid in a reverse flow direction, from said output port to said input port, along said control portion of said passageway, until a first predetermined pressure is reached at said output port, said flow control means comprising:

a ring spring;

means for mounting said ring spring to said body at said control portion of said passageway for axial flection generally parallel to said central portion of said fluid passageway;

a hollow member defining said central portion of said fluid passageway, said hollow member including a sealing surface circumscribing said central portion;

means for mounting said hollow member to said ring spring for limited movement within said body;

a movable seal configured to engage said sealing surface to block fluid passage from said output port to said inlet port;

means for urging said movable seal in said reverse flow direction towards said sealing surface, said urging means including a connection member having first and second ends, said second end connected to said movable seal;

said movable seal urging means including a spring, engaging said first end of said connection member, biasing said connection member in said reverse direction, said spring mounted to said body external of said passageway; and

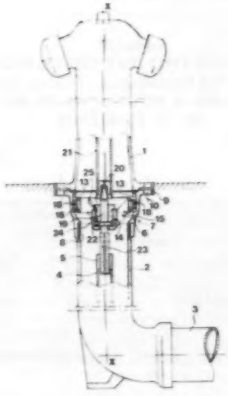
means for halting movement of said connection member in said reverse flow direction when said first predetermined pressure is reached at said output port thereby permitting fluid flow in said reverse flow direction.

4,440,190

CONTROL MECHANISM FOR A FIRE HYDRANT

Pierre L. Barbe, Toul, France, assignor to Pont-a-Mousson S.A., Nancy, France

Filed Feb. 9, 1982, Ser. No. 347,208
Claims priority, application France, Feb. 12, 1981, 81 02948
Int. Cl.³ E03B 9/02
U.S. Cl. 137—272 **7 Claims**



1. A control mechanism for a fire hydrant having an upper outer body (1) connected to a lower elongated pipe (2) containing a valve translationally engaging a valve seat, comprising:

a control rod (19) controlling the translation of said valve and extending above said elongated pipe;

a support holder (6) fixed on a lower end to the upper end of said elongated pipe, said support having housings (11–13) formed in its interior surface between its upper and lower ends, at least one housing being a vertical housing parallel to the vertical axis (X—X) of the fire hydrant; and

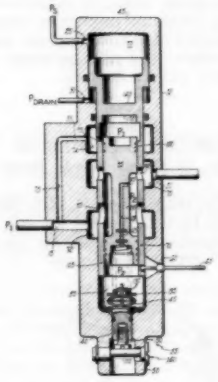
a support member (7) comprising a central sleeve (14) engagable with said control rod, radial arms (15) extending outward from said sleeve, and a one-piece cast circular rim (16) further comprising on its outer circumferential surface at least one lug (18) engaging one of said vertical housings and two cylindrical diametrically opposed bosses (17) engaging two of said housings on a horizontal axis (Y—Y) for rotating said support member about said horizontal axis during installation, said lugs and bosses upon installation locking said support member to said support holder, thereby preventing the expulsion of said valve.

4,440,191

FLOW CONTROL DEVICE

Kenneth P. Hansen, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 23, 1982, Ser. No. 421,760
Int. Cl.³ G05D 7/01
U.S. Cl. 137—468 **9 Claims**



1. A flow control device comprising a housing having fluid inlet and fluid outlet passages therein, a first valve element disposed within said housing, a second valve element disposed within said first valve element, said first and second valve elements being disposed in selective communication with said inlet and outlet passages, said flow control device being characterized by:

said first valve element comprising a metering element having inlet and outlet windows therein corresponding to, and communicating with said fluid inlet and outlet passages, respectively, said metering valve element being selectively positionable within said housing such that one of said windows is disposed in selectively variable registry with the corresponding passage for adjusting the effective flow area therebetween;

said second valve element comprising a pressure regulating element having first and second ends thereof and including a first portion in variable registry with the other of said windows in said metering element for adjusting the flow therethrough; said pressure regulating valve element being grounded to said housing for movement independent of that of said metering element for enhanced accuracy in the maintenance of a constant pressure drop across said one metering valve window;

means providing fluid communication between said corresponding passage and said second end of said pressure regulating element;

means providing fluid communication between said one window on a side thereof opposite said corresponding passage and said first end of said pressure regulating element; and

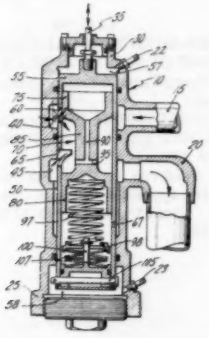
means for balancing said pressure regulating element against fluid pressure on said first and second ends thereof for establishing a registry between said other window and said first portion of said pressure regulating valve element necessary to maintain a relatively constant pressure drop across said one window.

4,440,192

MINIMIZATION OF PRESSURE DROP VARIATION IN FLOW CONTROLLERS

Brian G. Donnelly, West Suffield, Conn., and Charles F. Stearns, East Longmeadow, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 23, 1982, Ser. No. 421,759
Int. Cl.[3] G05D 7/01
U.S. Cl. 137—501 2 Claims



1. A flow controller comprising a housing having fluid inlet and outlet passages therein,

a metering valve element having inlet and outlet windows therein corresponding to said inlet and outlet passages, said metering valve element being disposed in said housing such that at least one of said metering valve windows is in variable registry with a corresponding passage for adjusting the effective flow area therebetween,

a pressure regulating valve element disposed within said metering valve element, a first portion of said pressure regulating valve element being in variable registry with the other of said metering valve windows, an unobstructed portion of said other window allowing flow therethrough, said pressure regulating valve element being pressurized on opposite ends thereof with fluid pressure on opposite sides of said one metering valve window and biased by a spring which balances the net force on said pressure regulating valve element due to any difference in pressure on the opposite ends thereof,

said flow control device being characterized by the spring having a spring rate substantially equal to the product

$$2A/X \cos \theta \Delta P_{cont}$$

wherein:

A is the flow area of said other window at a maximum required flow through the controller;

X is the maximum stroke of said pressure regulating valve element at said maximum required flow through said controller;

θ is the angle through which the flow through the controller is turned by the pressure regulating valve element; and

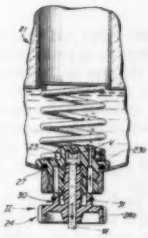
ΔP_{cont} is the maximum required pressure drop across said flow controller.

4,440,193

VALVE ASSEMBLY

Charles L. Matheson, Cookeville, Tenn., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Nov. 23, 1981, Ser. No. 323,940
Int. Cl.[3] F16K 37/00, 24/02
U.S. Cl. 137—558 8 Claims



1. A valve assembly for use in controlling flow of liquid accumulated in a closed vessel through a drain port formed therein, said assembly comprising a body member for fixedly mounting on the vessel and aligned with the drain port, and a valve piece mounted on said body member for selective adjustment relative thereto between open and closed positions; said body member including a first section for extending through the drain port and into the vessel interior and the liquid accumulated therein, a second section for securing to the vessel and from which said first section extends in one direction into the vessel interior, and an exposed third section extending in an opposite direction from said second section and being adapted to project outwardly from the exterior of the vessel, said first, second, and third sections being provided with a common primary passage and a common secondary passage independent of said primary passage, one end of each passage being concealed in the vessel interior and terminating within the accumulated liquid and the opposite end of each passage being exposed and terminating externally of the vessel, said first section having a valve seat fixedly mounted in spaced relation with respect to said one end of the primary passage; said valve piece including an elongated first element mounted for sealing endwise adjustment within the primary passage of said body member and having a longitudinally extending bore formed therein and open at opposite ends, one end of said bore being concealed within said body member and the opposite end being exposed and disposed externally of the vessel, said bore one end being closed off by said valve seat when said valve piece is in said closed position, an exposed flange element disposed externally of the vessel and outwardly of the body member third section, said exposed flange encompassing an exterior portion of said first element, and an exposed, annular seal element carried by and extending from said flange element and sealingly engaging and closing off the exposed end of the secondary passage when said valve piece is in said closed position, said seal element assuming a non-sealing engagement with the end of the secondary passage subsequent to the bore end of said first element having moved a predetermined distance away from said valve seat.

4,440,194

MOVING BODY AND METHOD OF PERFORMING WORK WITHIN PIPES WITH USE OF SAME

Namio Kinumoto, Osaka; Takashi Nakao, Katano; Hiroshi Murase, Sakai; Shigemitsu Okada, Takarazuka, and Shinichi Kawadoko, Osaka, all of Japan, assignors to Osaka Gas Company, Limited, Osaka, Japan

Filed Feb. 2, 1982, Ser. No. 344,967
Claims priority, application Japan, Feb. 29, 1980, 55-26683
Int. Cl.³ F16L 55/10
U.S. Cl. 138—89 8 Claims

1. In combination, a pipe and a moving body for performing work within said pipe by applying a fluid back pressure on the body as placed in the pipe to thereby move the body through the interior of the pipe, comprising two spherical members made of an elastic material, and a flexible linear member interconnecting the two spherical members, wherein the flexible linear member extending between opposed faces of the two spherical members is no greater in length than half of the diameter of the pipe.

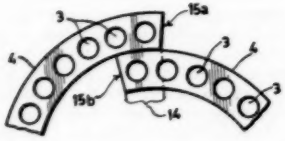
5. A method of performing work within a pipe comprising the steps of placing in the pipe a moving body comprising two spherical members made of an elastic material and interconnected by a flexible linear member, the length of the flexible linear member extending between the two spherical members being no greater than half the diameter of the pipe, and applying a fluid pressure to the back side of the moving body to thereby move the body along the line of flow through the pipe.

4,440,195

PLASTIC TUBE WITH LONGITUDINAL CHANNELS IN THE WALL

Jan P. van Dongeren, Bergentheim, Netherlands, assignor to Wavin B.V., Netherlands

Continuation of Ser. No. 304,159, Sep. 21, 1981, abandoned, which is a continuation of Ser. No. 73,613, Sep. 10, 1979, which is a continuation of Ser. No. 893,826, Apr. 6, 1978. This application Dec. 20, 1982, Ser. No. 451,172
Claims priority, application Netherlands, Apr. 6, 1977, 7703820
Int. Cl.³ F16L 9/18
U.S. Cl. 138—115 5 Claims



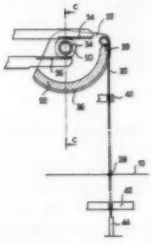
1. A tube having
an inner wall;
an outer wall;
a central channel, relatively large in comparison to the outer diameter of the tube, said central channel passing substantially through the center of the tube;
partition means for interconnecting said inner and outer walls;
a plurality of longitudinal channels formed by said partition means with said inner and outer walls;
said longitudinal channels being relatively small in comparison to the central channel and being interspaced along the circumference of said tube;
said central channel and each of said longitudinal channels having substantially rounded cross sections;
said inner wall having a structure substantially free of internal stresses, said tube manufactured according to a process comprising the steps of:
extruding a thermo-plastic material;
sizing and cooling the tube to a temperature distribution whereby the tube is form-stable; and thereafter
re-supplying heat quickly in a period of about five minutes or less to the outer side of the outer wall of the tube to a temperature over 50° C. such that the tube is not form-destabilized;
determining the internal stresses of the inner wall by cutting off an end of the tube and making a cut edge from the center to the outer side of the outer wall longitudinally along the end of the tube, such that edge parts of the cut end have an overlap with each other amounting to less than 5% of the circumference of the tube.

4,440,196

DOUBLE OPEN-SHED JACQUARD MACHINE FOR THE LIFTING OF WARP YARNS OF A LOOM

Tibor Arvai, Monte-Carlo, Monaco, assignor to Verdol S.A., Caluire, France

PCT No. PCT/FR81/00018, § 371 Date Oct. 5, 1981, § 102(e) Date Oct. 5, 1981, PCT Pub. No. WO81/02312, PCT Pub. Date Aug. 20, 1981
PCT Filed Feb. 17, 1981, Ser. No. 309,969
Claims priority, application Monaco, Feb. 18, 1980, 1432
Int. Cl.³ D03C 3/00, 13/00
U.S. Cl. 139—59 13 Claims



1. An open-shed jacquard machine having programming means for controlling in cycle with a loom a plurality of harness cords on either side of a layer of warp yarns, and each cord being provided with an eyelet through which a corresponding warp yarn passes, comprising:
(a) shaft means supporting a plurality of modules having pulleys and each pulley having a groove receiving a corresponding one of the harness cords which is fixed thereto;
(b) individual harness cord displacing means controlled by said programming means and associated with each pulley and operative when actuated to rotate the pulley through an angle corresponding with the desired lift of the harness cord;
(c) each harness cord displacing means being located on the opposite side of the shaft means from the side where the pulley receives the harness cord;
(d) said modules being disposed in rows which are tiered above the layer of warp yarns, the successive rows being offset progressively from one tier to the next in a direction parallel to the warp yarns; and
(e) the machine having two series of rows of modules disposed opposite to each other, said pulleys and the displacement means of the two opposed series being oriented in opposite directions extending parallel to the direction of

the warp yarns, the harness-cord receiving sides of the pulleys facing toward each other and the offsets of the rows of modules progressing symetrically and oppositely in directions parallel to the warp threads.

4,440,197

SHUTTLELESS LOOM

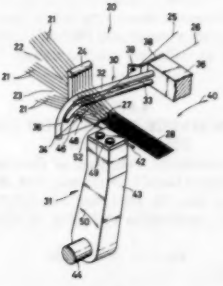
Yoshinori Masuda, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 160,166, Jun. 17, 1980. This application Aug. 9, 1982, Ser. No. 406,547

Claims priority, application Japan, Jun. 22, 1979, 54-79502

Int. Cl.³ D03D *47/42*

U.S. Cl. 139—431 **3 Claims**



1. A shuttleless loom for weaving a fabric, comprising:

(a) means for inserting a pair of successive loops of weft yarns simultaneously through respective superimposed warp sheds from a first side thereof, said inserting means comprising a pair of spaced upper and lower arcuate fingers arranged one above the other in superposed relation with each other and reciproable respectively through a corresponding one of said superposed sheds along a first arcuate path in a first plane extending substantially parallel to the plane of the fabric being woven, each of said fingers having at its free end an eye for passage therethrough of one of said weft yarns supplied to the fell of the fabric, means for reciprocating said fingers between a first position in which both of said eyes are on said first side of said warp sheds at a first side of the fabric and a second position in which both of said eyes are beyond a second side of both of said warp sheds at a second side of the fabric, one of said fingers being sufficiently longer than the other so that when said fingers are in said second position said weft yarns supplied through said eyes to said fell jointly define therebetween an angular space in the general plane of the fabric being woven; and

(b) means arranged along the second side of said warp sheds for forming a knitted selvedge at one edge of the fabric being woven, said selvedge-forming means including a single knitting needle having at its free end a hook reciprocable in timed relation with said arcuate fingers along a second arcuate path in a second plane extending substantially perpendicularly to said first plane in such a manner that said hook reciprocates within said angular space to pass through a single loop of the weft yarn inserted by said longer finger and to catch and knit only the weft yarn extending freely between the fell of the fabric and the eye of said shorter finger.

4,440,198

APPARATUS FOR GUIDING WEFT YARNS IN A JET LOOM

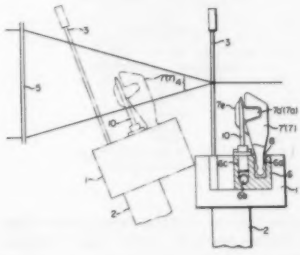
Hajime Suzuki, Anjyo, and Hiroshi Arakawa, Kariya, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation of Ser. No. 129,411, Mar. 11, 1980, abandoned. This application Mar. 9, 1982, Ser. No. 356,360

Claims priority, application Japan, Mar. 17, 1979, 54-31340; Jun. 25, 1979, 54-79102

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **11 Claims**



1. An apparatus for guiding a weft yarn inserted into a shed, formed between lower and upper warp yarns, by a jet of fluid discharged from a main nozzle positioned beside a jet loom, said apparatus comprising:

a number of weft guiding members arranged in spaced relationship with each other and in parallel to a reed of the jet loom, said weft guiding members each having an aperture with an opening allowing the weft yarn to exit out of the apertures after it has been inserted into the shed, said apertures providing a continuous weft guiding channel;

said weft guiding members being formed of a first group of weft guiding members of which the openings are of a relatively narrow width less than the size of said apertures and are formed in upper parts of said first group of weft guiding members;

sub-nozzles each having at least one fluid outlet discharging a jet of fluid to assist the fluid jet produced by the main nozzle in inserting the weft yarn into the shed, each of said sub-nozzles being positioned between the reed and said guide members with an axis of said at least one fluid outlet inclined at a predetermined angle with respect to the direction of the weft yarn insertion, so that the fluid jet produced by the respective sub-nozzle is obliquely directed toward surfaces of the apertures in said first group of weft guiding members downstream of said respective sub-nozzle with respect to said direction of the weft yarn insertion, which surfaces are positioned away from the reed; and

said surfaces of the apertures in said first group of weft guiding members, toward which the fluid jets produced by said sub-nozzles are directed, each extending in a substantially straight direction and substantially vertically in a beat-up position of said weft guiding members.

4,440,199

METHOD OF FORMING WIRING FOR BOTTLE STOPPERS

Bernard Montoriol, Germaine, France, assignor to Etablissements F. Valentin, Epernay, France

Filed Jul. 21, 1981, Ser. No. 285,660

Claims priority, application France, Jul. 23, 1980, 80 16404

Int. Cl.³ B21F *45/00*

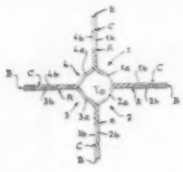
U.S. Cl. 140—71 R **1 Claim**

1. The method of manufacturing wiring for securing a stopper in a bottle of sparkling liquid, comprising the steps of:

(a) shaping multiple wires to provide multiple separate components, each having a central arcuate portion with two straight branches comprising the ends of the wire lying in the same plane as the arcuate portion and extending outwardly substantially radially therefrom;

(b) supporting said components substantially in a common plane with their arcuate portions forming a circle about a central point in the plane and their straight branches extending in pairs away from said point to provide multiple double branches;

(c) twisting the straight branches of each double branch along a first portion of their lengths which extends from



their arcuate portions part-way toward their outer ends, and stopping the twisting to leave an intermediate straight portion of the double branches wherein the branches extend mutually parallel;

(d) further twisting the branches of each double branch to form a second twisted portion located beyond said intermediate straight portion and near said outer ends; and

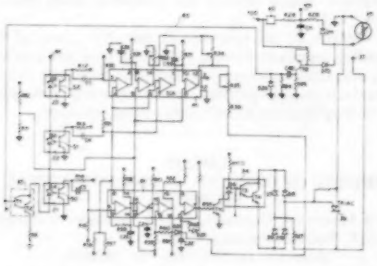
(e) rolling each double branch near its outer ends to form a loop terminating the double branch, each loop lying substantially normal to said common plane and each loop including the second twisted portion of the associated double branch.

4,440,200

LIQUID DISPENSER WITH TIMING CIRCUIT

Donald P. DeVale, Sycamore, and Joseph Wieser, Lake Villa, both of Ill., assignors to Everpure, Inc., Westmont, Ill.

Filed May 12, 1981, Ser. No. 262,923
Int. Cl.³ B65B *1/42*
U.S. Cl. 141—95 **1 Claim**



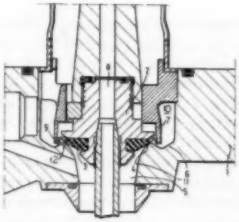
1. A beverage dispenser for automatically filling cups of different sizes comprising, a stand on which cups of various sizes can be placed, small, medium and large cup sensors for small, medium and large cups mounted on said stand and positioned to sense the cups of different sizes, a fluid dispensing valve and nozzle mounted on the stand for filling said cups, an a.c. voltage source, said small, medium and large cup sensors connected to said a.c. voltage source and passing pulses to their outputs when cups of various sizes are present on said stand, an on delay circuit connected to the output of the small cup sensor and producing an output signal only if said small cup dispenser is energized for a finite time, a beverage dispensing switch means connected to said fluid dispensing valve to control it and receiving the output of said on delay circuit, and small, medium and large cup timing circuits connected to said small, medium and large cup sensors and supplying an input to said beverage dispensing switch means, wherein said small cup timing circuit comprises a capacitor and a first resistor, wherein said medium cup timing circuit includes a second resistor which is placed in series with said first resistor when said medium cup sensor is energized, including a third resistor which is placed in series with said first and second resistors when said large cup sensor is energized, and wherein said on delay circuit comprises a fourth resistor and a second capacitor, including a feedback means connected to said on delay circuit and said beverage dispensing switch means to prevent it from chattering, and wherein said feedback means comprises a fifth resistor and an unilateral current means.

4,440,201

LIQUID DISCHARGE NOZZLE FOR CONTAINER FILLING VALVES

Uwe Knabe, Holzwickede, Fed. Rep. of Germany, assignor to Holstein & Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,715
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045854
Int. Cl.³ B67C *3/06*
U.S. Cl. 141—286 **7 Claims**



1. A liquid discharge nozzle for a container filling valve, comprising an inner member centered on a substantially vertical axis and having a lower end; a hollow outer member surrounding and bounding a passage for downward flow of liquid with said inner member and having a valve seat and a ridge which delimits an annular groove which partially receives said lower end of said inner member upstream of said valve seat in said passage and therefore prevents escape of a gas through the liquid, but at the same time tends to cause turbulence of the liquid; and means defining at least one opening which extends through said ridge from said groove to slightly upwardly of said valve seat and eliminates the turbulence of the liquid.

4,440,202

TREE DELIMBER

Colvin K. Everett, 701 Terral Island Rd., Farmerville, La. 71241

Filed Feb. 14, 1983, Ser. No. 466,129
Int. Cl.³ A01G *23/08*; B27L *1/00*
U.S. Cl. 144—2 Z **6 Claims**

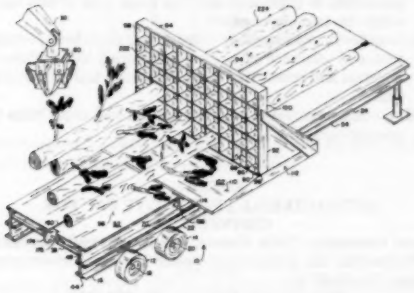
1. A log processor comprising:

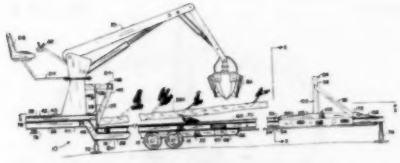
an elongated platform, including an elongated track;

stop means, including a support attached to said platform

and having a rigidly supported area region extending across said platform, for providing a stationary support against which cut logs generally lying horizontally and longitudinally on said platform are generally blocked from horizontal movement in one longitudinal direction;

cutting means, including a base movable on said track and a grid of crossed blades supported on said base and facing said area of said stop means, for receiving ends of logs





between said blades and, upon relative movement between said blades and logs, for cutting limbs from the logs; and

motive means coupled between said platform and said cutting means for moving said cutting means on said track toward and away from said stop means, whereby logs placed on said platform may be delimbed by said cutting means.

4,440,203

ARRANGEMENT FOR INSERTING BLOCKS OF TIMBER IN A TIMBER PROCESSING MACHINE

Sven E. Östberg, Söderhamn, Sweden, assignor to Kockums Industri AB, Soderhamn, Sweden

Filed Jun. 22, 1981, Ser. No. 275,904
Claims priority, application Sweden, Jul. 3, 1980, 8004918
Int. Cl.³ B27C 9/00
U.S. Cl. 144—39 **12 Claims**

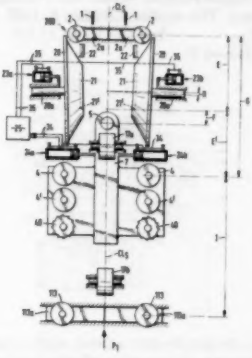
1. An apparatus for feeding a block of timber along a feed path into a timber processing machine having at least one processing tool operating along a fixed centre axis, said apparatus comprising:

first guide means for said block positioned directly in front of said processing machine, said guide means positioning the centre of said block substantially on said centre axis;

second guide means for said block positioned a first distance from said first guide means, said guide means being movable perpendicularly to said centre axis to position the centre of said block a second distance from said centre axis;

third guide means for said block positioned a third distance from said first guide means, with said second guide means positioned therebetween, said third guide means being movable perpendicularly to said centre axis to position the centre of said block a fourth distance from said centre axis; and

control means for simultaneously moving said second and



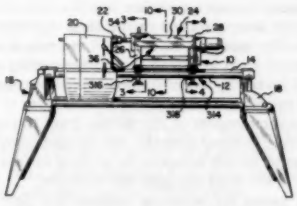
third guide means perendicularly to said centre axis in fixed relation to each other so that said second and fourth distances lie on an arcuate line which is tangent to said centre axis at said processing tool.

4,440,204

PLANER MOUNTING SYSTEM

Robert L. Bartlett, Dayton, Ohio, assignor to Shopsmith, Inc., Vandalia, Ohio

Filed Aug. 16, 1982, Ser. No. 408,531
Int. Cl.³ B27C 1/02
U.S. Cl. 144—130 **4 Claims**



1. In combination with a wood working machine of the type having a head stock including an output shaft having a substantially horizontal axis of rotation, a pair of ways oriented parallel to each other and to said axis of rotation and supporting said head stock for slidable movement therealong, a frame supporting said ways at ends thereof, and a planer having a housing including a pair of opposing side walls, a blade member rotatably mounted to and extending between said side walls and having a coupling portion extending through one of said side walls and terminating exteriorly of said housing, a planer mounting system comprising:

means attached to said planer housing for releasably mounting said planer to said ways;

the vertical distance between said attaching means and said coupling portion being substantially equal to the vertical distance between said ways and said head stock output shaft, such that said blade member and said coupling portion are coaxial with said axis of rotation of said output shaft; and

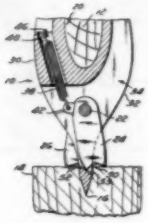
a coupling member coaxial with said output shaft and said coupling portion and extending there-between such that said coupling member transmits rotary power from said output shaft to said coupling portion along said axis.

4,440,205

WEDGE AND AXE HEAD

George Hillinger, Los Angeles, Calif., assignor to Alltrade, Inc., City of Commerce, Calif.

Continuation-in-part of Ser. No. 176,530, Aug. 8, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 355,869
Int. Cl.³ B26B 23/00
U.S. Cl. 145—2 R 7 Claims



1. In a device having a head with a longitudinal cutting surface formed on one edge of said head so as to lie on the longitudinal plane of symmetry of the head, the combination of:

a longitudinal pivot aperture formed in said head and disposed so as to lie in the longitudinal plane of symmetry;

lever aperture means formed in the body between the pivot aperture and the cutting surface so as to extend transversely across the head and intersect the pivot aperture;

a first lever disposed in the lever aperture means and pivotally mounted to the head by means of the pivot aperture so as to extend towards the cutting surface;

first lever stop means formed in the lever aperture means and operable to engage the first lever to prevent the pivotal movement of the first lever through the lever aperture means, whereby the first lever is laterally offset at its end adjacent the cutting surface to a first side of the head;

a second lever disposed in the lever aperture means and pivotally mounted to the head by means of the pivot aperture so as to extend toward the cutting surface;

second lever stop means formed in the lever aperture means and operable to engage the second lever to prevent the pivotal movement of the second lever through the lever aperture means, whereby the second lever is laterally offset at its end adjacent the cutting surface to a second side of the head opposite said first side;

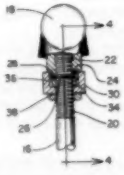
spring means for normally holding said first and second lever remote ends against the first and second lever stop means.

4,440,206

UNIVERSAL HAMMER HAVING INTERCHANGEABLE HEADS

John R. Dart, 998 Racine Ave., Columbus, Ohio 43204

Filed Mar. 10, 1983, Ser. No. 474,154
Int. Cl.³ B25C 1/00
U.S. Cl. 145—29 R 6 Claims



1. A universal hammer having a quick release, detachable handle and head portions to permit interchange of the head with another head, said hammer comprising:

(a) at least one head having a bore formed as a part of a coupling means to receive a universal handle and having a cross hole formed transversely through said bore;

(b) a universal handle having a shank formed as a mating coupling means to extend into and engage said bore to connect said head to said handle, said handle having a cross hole formed transversely through said shank and positioned in alignment with the cross hole of said head when the two are engaged;

(c) a slideable pin extending through said cross holes, a cross sectional tolerance of said pin permitting low resistance insertion and removal of said pin through said cross holes; and

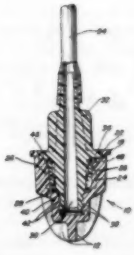
(d) a collar removably attached around said cross holes to prevent withdrawal of said pin.

4,440,207

ANTIBACTERIAL PROTECTIVE CAP FOR CONNECTORS

Vince Genatempo, Lake Geneva, Wis., and Frank Karrasch, Wadsworth, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 14, 1982, Ser. No. 378,315
Int. Cl.³ A61M 5/14
U.S. Cl. 150—52 R 15 Claims



1. A protective cap for a connector which securely receives and provides antibacterial effect to the connector, said cap comprising:

a first outer chamber having an external opening fixedly lined with absorbent material, said absorbent material retaining an antiseptic, said first outer chamber being defined by a skirt proportioned for sealing engagement with the connector; and

a second, inner chamber having a closed inner end, smaller than said first chamber, adjacent and open to said first chamber, having connecting means for receiving connecting means from said connector.

4,440,208

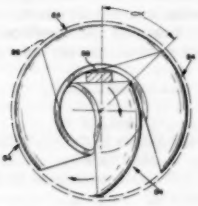
COMPOSITE, SOLID, VEHICLE TIRE

Lorn L. Trickel, and William H. Stultz, both of Portland, Oreg., assignors to Precured RDF Tirefill, Inc., Portland, Oreg.

Continuation of Ser. No. 188,295, Sep. 18, 1980, abandoned, and a continuation-in-part of Ser. No. 141,067, Apr. 17, 1980, abandoned. This application Apr. 26, 1982, Ser. No. 371,713
Int. Cl.³ B60C 7/00
U.S. Cl. 152—314 1 Claim

1. A composite vehicle tire comprising a tire casing and within the casing four substantially identical filler segments arranged end to end, each segment comprising a mass heat and pressure-consolidated from resilient particulate rubber material and having an arcuate contour and a cross section substantially similar to the cross section of the inside of the casing but larger by an increment predetermined for a pressure fit, the

opposite end faces of each segment being substantially planar and disposed in intersecting planes which extend substantially



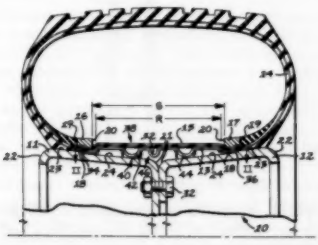
perpendicular to each other and substantially tangent to the inner circumference of the arcuate contour.

4,440,209

SPLIT RIM WITH AXIALLY LOCATED SPLIT BAND

Robert J. Grob, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 19, 1982, Ser. No. 399,627
Int. Cl.³ B60C 5/12
U.S. Cl. 152—397 9 Claims



1. A split rim arrangement (10) for use with a closed torus tire (14) having a substantially flat tire rimwall portion (15) at its inner diameter and first and second inextensible roll hoops (16,17) mounted about the tire rimwall portion (15) and having a spaced (S) apart relationship, comprising:

a transversely split band (13) having first and second edges (34,36) and a radially outwardly extending center portion (38) having a width (R) less than the space (S) between the roll hoops (16,17), the split band (13) has a width (W) greater than the space (S) between the roll hoops (16,17) of the closed torus tire (14);

first and second rim halves (11,12) each having inner and outer edges (21,22), a first tapered diameter (23) adjacent the outer edge (22), a second smaller tapered diameter (24) adjacent the first tapered diameter (23), the first and second tapered diameters (23,24) being tapered inwardly from the outer edge (22) toward the inner edge (21), shoulders (28) being defined at the juncture of the first and second tapered diameters (23,24), the total width of both of the second tapered diameters (24) being substantially equal to the width (W) of the split band (13), the first and second edges (34,36) of the split band being located on the second tapered diameter (24) of the first and second rim halves (11,12) and located under the roll hoops (16,17) of the closed torus tire (14); and

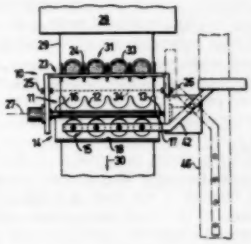
a plurality of bolts (32) connecting the first and second rim halves (11,12).

4,440,210

MOLD STRIPPER

Rune Lohman, 16 Smedjevägen, S-131 00 Nacka, Sweden

Filed Nov. 4, 1981, Ser. No. 318,193
Claims priority, application Sweden, Nov. 5, 1980, 8007751
Int. Cl.³ B22C 17/08
U.S. Cl. 164—409 9 Claims



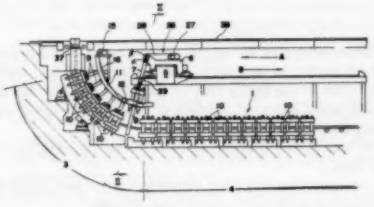
1. An apparatus for automatically stripping upwardly open molds advanced on a conveying surface from their content, comprising mold turn-over means pivotal about a horizontal axis located above the conveying surface for swinging movement between first and second end positions in each of which said turn-over means is substantially in parallel with the conveying surface, said turn-over means having mold-engaging surfaces for receiving in said first end position at least one mold approaching on the conveying surface to the mold turn-over means, and mold receiving means also pivotal about said axis, said receiving means being swingable toward said turn-over means to a first position for retaining a mold against said turn-over means when said turn-over means is in its first end position, and said turn-over means and said receiving means being swingable together to said second end position whereby a mold held between said turn-over means and said receiving means becomes inverted, said receiving means having at least one opening which in said second position permits the content of a mold to fall through the mold receiving means and down onto the conveying surface.

4,440,211

APPARATUS FOR HOISTING ROLL SEGMENTS IN CONTINUOUS CASTING EQUIPMENT

Kuniaki Ono, Nara, Japan, assignor to Hitachi Shipbuilding & Engineering Company Limited, Osaka, Japan

Filed Apr. 2, 1982, Ser. No. 364,687
Int. Cl.³ B22D 11/128
U.S. Cl. 164—442 5 Claims



1. In continuous casting equipment having a path of transport of castings which is defined by a plurality of roll segments and has a curved section and a horizontal section, an apparatus for hoisting an optional roll segment comprising:

a trolley provided movably above the horizontal section,

a pair of pivotal guide rods pivotally supported by the trolley,

a pair of fixed guide rods arranged on the opposite sides of each of the roll segments defining the curved section,

a pair of fixed circular arc rails extending along the paths of movement of the free ends of the pivotal guide rods,

a truck having a pair of front wheels and pair of rear wheels movable on the rails;

means for engaging the truck with the pivotal guide rods,

means for reciprocating the truck along the rails together with the pivotal guide rods in engagement with the truck,

means for locking the pivotal guide rods in a position where the pivotal guide rods are continuous with a selected pair of fixed guide rods, and

means for hoisting a corresponding roll segment along said selected pair of fixed guide rods to the pivotal guide rods when the pivotal guide rods are made continuous with the fixed guide rods, wherein:

the locking means is provided in the form of pairs of recesses formed in the circular arc rails in corresponding relation to the pairs of fixed guide rods, the rear wheels of the truck being positionable in each pair of recesses to lock the truck to the rails so that the pivotal guide rods, when in engagement with the truck, are indirectly locked to the rails in alignment with a corresponding pair of fixed guide rods, and

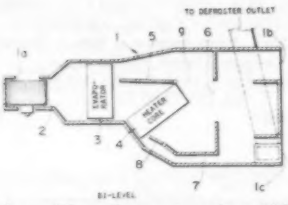
the engaging means comprises a pair of rollers mounted on the free ends of the pivotal guide rods individually, a pair of passage cutouts formed in the rear end of the truck for permitting the rollers to pass therethrough individually, and a pair of elongated engaging grooves formed in the rear end of the truck in communication with the respective cutouts for the rollers to fit in slightly when the truck is in a state for movement but deeply when the truck is locked to the rails.

4,440,212

AIR-CONDITIONER FOR AN AUTOMOTIVE VEHICLE

Mikio Tanino, and Yukio Shimada, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 22, 1981, Ser. No. 275,742
Claims priority, application Japan, Jul. 7, 1980, 55-92562
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—12 **14 Claims**



1. An air-conditioner for an automotive vehicle comprising:

(a) a duct having an air inlet at one end thereof and a ventilation outlet at the upper part of the other end thereof and a floor outlet linked to a defroster outlet at the lower part of the other end thereof;

(b) a blower disposed at the air inlet for introducing air into said duct;

(c) an evaporator disposed downstream of said duct for cooling the air introduced by said blower;

(d) a heater core disposed downstream of said evaporator whose upper side is provided with a first bypass for bypassing the cooled air from said evaporator;

(e) an air mixing door disposed upstream of the heater core for adjusting the amount of air passing through the heater core;

(f) an air mixing chamber disposed downstream of the heater core and the first bypass for mixing the air from the first bypass and heater core, the ratio of the two types of air depending on the angle of said air mixing door;

(g) a second bypass disposed between said heater core and said air mixing chamber for introducing part of the heated air from said heater core directly into the floor outlet; and

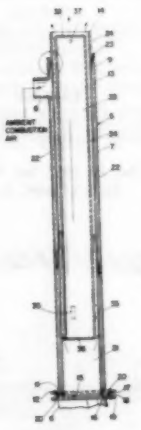
(h) a smaller door located at said heater core for adjusting the amount of heated air passing through said second bypass.

4,440,213

RECUPERATOR WITH FLOATING INTERIOR HOUSING

Robert E. Sarvis, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sep. 11, 1981, Ser. No. 301,314
Int. Cl.³ F24H *3/00*
U.S. Cl. 165—47 **3 Claims**



2. A simplified, unwelded recuperator in which the components which are subject to higher temperatures and greater wear are easily removed and replaced with a minimum of down time and without breaking welds, the recuperator comprising:

(a) a hollow, outer casing having opposed lower and upper open ends and including peripherally facing fluid inlet and outlet openings therethrough, the casing lower end having an outwardly extending peripheral flange, the casing upper end being rigidly connected with an annular stationary member which extends peripherally therearound, the stationary member having an L-shaped transverse cross section with a major leg extending peripherally around, parallel to and upwardly above the outer casing, the stationary member further having a minor leg extending radially inward from the major leg;

(b) a hollow, heat conductive housing having opposed upper and lower open ends, the housing being disposed interiorly of the outer casing and extending longitudinally thereof slidably through the stationary member minor leg, the housing lower end extending beyond the casing lower end flange and having a radially outward extending rim disposed longitudinally spaced from the casing lower end flange, the housing upper end extending upwardly beyond the outer casing upper end and defining a fluid discharge opening therethrough, the housing and outer casing defining an outer fluid passage therebetween for receiving air to be heated;

(c) a cylindrical core with closed ends disposed longitudinally within the housing and radially displaced therefrom such that an inner fluid passage is defined therebetween for passing exhaust gases therethrough;

(d) lower mounting means for mounting the housing and outer casing with a flue pipe in a spaced relationship to each other, the lower mounting means including a first compressible annular sealing ring sandwiched between the housing annular rim and casing flange, a second compressible annular sealing ring sandwiched between the housing rim and the flue pipe, a plurality of threaded fasteners which releasably compress the flange, rim, flue pipe, and sealing rings together such that the outer fluid passage is sealed at the lower end of the outer casing and the housing with the flue pipe disposed in fluid communication with the inner fluid passage, the casing and housing to be selectively removed from a mounted relationship relative to the flue pipe;

(e) an upper mounting means for sealing the outer fluid passage adjacent the outer casing upper end, the upper mounting means including a plurality of annular sealing rings stacked on the stationary minor leg and extending radially betweeen the housing and the stationary major leg, a movable annular member which is L-shaped in transverse cross section slidably received around the housing, the movable member having a major leg received between the housing and the stationary member major leg and a minor leg extending radially outward therefrom above the stationary member major leg, and plurality of threaded fasteners extending between the movable minor leg and the stationary member major leg for selectively causing the movable member to be moved against the stacked sealing rings for compressing them into engagement with the housing and stationary member, whereby the housing and casing are sealingly connected but movable relative to each other to allow for uneven expansion and contraction when the housing temperature fluctuates over a wider range of tempertures than the casing; and,

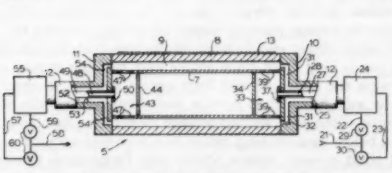
(f) unwelded core mounting means for mounting the cylindrical core centrally within the housing for ready removal and replacement without breaking welds, the core mounting means including a plurality of spacer bars disposed peripherally around a lower end of the cylindrical core to space the core generally centrally within the housing without impeding the flow of exhaust gases therebetween, and a spacer member extending through an upper end of the cylindrical core and housing above the upper end of the outer casing, remote from the flue stack and hot exhaust gases discharging therefrom, for supporting the core and for spacing the core generally centrally within the housing with the core lowermost end being displaced longitudinally inward from the housing and casing lower ends to define a region for receiving hot exhaust gases from the flue stack, whereby wear from the turbulence as the hot exhaust gases are channeled into the inner fluid passage tends to cause wear of the readily replaceable housing and cylindrical core rather than the flue pipe, the spacer member being readily removable for allowing the core to be withdrawn from the housing.

4,440,214

HEAT TRANSFER ROLL AND METHOD

Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed May 30, 1980, Ser. No. 154,946
Int. Cl.³ F28F 5/02
U.S. Cl. 165—90 **26 Claims**



1. In combination in a rotary heat transfer roll having concentric inner and outer differential diameter tubular shells defining an annular passage therebetween, roll heads closing opposite first and second ends of said passage, and means at said roll heads for mounting the roll rotatably for running on the perimeter of said outer shell of a travelling web to be temperature conditioned:

means for introducing and distributing temperature conditioning fluid through said first end roll head, in part directly into said first end of said annular passage and in part through said inner shell into said annular passage adjacently downstream relative to said first end to join said directly introduced conditioning fluid and then to circulate through said annular passage towards said second end; and

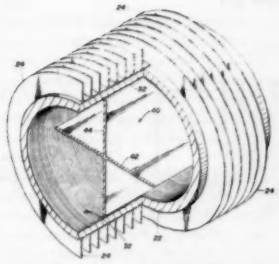
means for evacuating spent conditioning fluid from said second end through said second end roll head, in part directly from said second end of said annular passage and in part through said inner shell adjacently upstream relative to said second end.

4,440,215

HEAT PIPE

George M. Grover, Los Alamos, and James E. Runyan, Santa Fe, both of N. Mex., assignors to Q-dot Corporation, Garland, Tex.

Continuation of Ser. No. 547,955, Feb. 7, 1975, abandoned, which is a continuation of Ser. No. 350,799, Apr. 13, 1973, Pat. No. 3,865,184, which is a continuation of Ser. No. 113,571, Feb. 8, 1971, abandoned. This application Jun. 17, 1981, Ser. No. 274,674
The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.
Int. Cl.³ F28D 15/00
U.S. Cl. 165—104.21 **17 Claims**



1. The thermal transfer device comprising:

an elongated, substantially straight, sealed tubular envelope having at least an evaporating section and a condensing section between which thermal energy is to be transferred at an operating temperature;

a working fluid having a liquid phase and a vapor phase at the operating temperature, the liquid phase standing along the bottom of the envelope only to a level less than the height of the portion of the envelope forming the section and flowing only by gravity from the condenser section to the evaporator section, and

a plurality of circumferentially extending capillary grooves extending along both the evaporating and condensing sections for transporting the liquid phase circumferentially of the envelope and upwardly from the liquid standing along the bottom of the envelope.

2. The thermal energy transfer device comprising:

a sealed enveloped comprising a generally horizontally disposed cylindrical tubular member having sealed ends and having walls formed of a generally homogeneous metal and at least an evaporator section and a condenser

section between which thermal energy is to be transferred,

a working fluid having a liquid phase and a vapor phase at the operating temperature of the device, the liquid phase standing in at least one section to a level less than the height of the portion of the envelope forming said one section and flowing by gravity from the condenser section to the evaporator section,

a plurality of capillary grooves extending circumferentially around the interior surface of said tubular member in at least said one section for transporting the liquid phase upwardly above the level of the liquid phase in said one section by capillary action, and

means for partitioning said tubular member to at least partially separate the longitudinal flow of vapor phase fluid in the upper portion of said tubular member from the liquid phase fluid in the lower portion, said partitioning means including a generally horizontally disposed plate and a generally vertically disposed plate each extending substantial across a diameter of said tubular member and along a substantially portion of the length of said tubular member, at least one of said plate members extending into contact with the sidewalls of said tubular member to support said partitioning means.

4,440,216

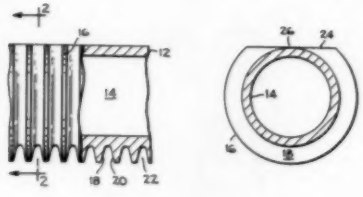
FINNED HEAT EXCHANGER TUBE

Raul J. Conti, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 121,734, Feb. 18, 1980, abandoned. This application Jul. 12, 1982, Ser. No. 397,579

Int. Cl.³ F28D *3/04*

U.S. Cl. 165—117 **5 Claims**



1. An article of manufacture for affording heat transfer between a fluid and a liquid comprising a wall defining a closed smooth internal fluid passage, a plurality of substantially parallel fins projecting substantially radially from said wall externally of said passage and being integral with said wall, said fins being spaced from one another to form a plurality of substantially parallel interfin spaces, said interfin spaces being dimensioned to avoid substantial liquid retention therein, said fins each having a radially foreshortened portion at a circumferentially limited region to form a continuous noncapillary liquid flow path that extends along an imaginary longitudinal line on the external surfaces of said wall and parallel to said passage thereby to establish free gravity induced liquid communication between said interfin spaces when said article is oriented so that said passage is substantially horizontal, each said foreshortened portion being defined by a surface wherein said surfaces of all said fins are coplanar and extend substantially tangentially of the external surface of said wall and transversely of said imaginary line, said article being oriented with said liquid flow path at the top so that liquid can flow axially thereof on to said fin surfaces and between said fins.

4,440,217

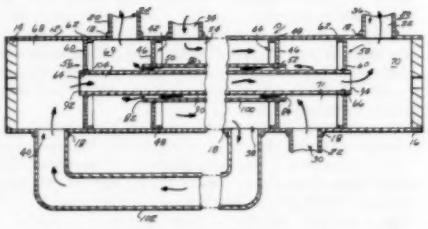
COUNTERFLOW HEAT EXCHANGER

Scott M. Stieler, 3114 Fenner #10, Marlette, Mich. 48453

Filed Jun. 10, 1982, Ser. No. 386,936

Int. Cl.³ F28D *7/10*; F28F *9/22*

U.S. Cl. 165—155 **5 Claims**



1. A heat exchanger for exchanging heat between first and second fluids having different temperatures comprising:

a sealed housing;

a first inlet and a first outlet formed in the housing;

a first conduit disposed within the housing;

a second conduit concentrically disposed within and spaced from the first conduit to define a first flow path between the wall surfaces of the first and second conduits, the first flow path being disposed in fluid flow communication with the first inlet and the first outlet for flow of the first fluid in a first direction through the housing between the first inlet and the first outlet;

a second inlet and second outlet formed in the housing; and

means, including first and second serially connected portions, for forming a second flow path between the second inlet and the second outlet for flow of the second fluid through the housing in a second direction opposed to the first flow direction of the first fluid, the first portion of the second flow path being across the exterior surface of the first conduit and the second portion of the second flow path being through the second conduit, the means for forming the second flow path including:

first means, disposed in the housing, for directing flow of the second fluid across the exterior wall surface of the first conduit in the second direction; and

a third conduit disposed externally from the housing,

the third conduit having a third inlet disposed in fluid flow communication with the first means for directing the second fluid flow and a third outlet disposed in fluid flow communication with one end of the second conduit for directing flow of the second fluid from the first means for directing second fluid flow to the one end of the second conduit.

4,440,218

SLURRY UP PARTICULATE PLACEMENT TOOL

David L. Farley, Lafayette, La., assignor to Completion Services, Inc., Lafayette, La.

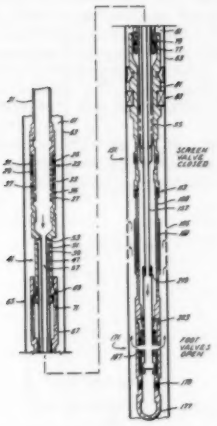
Filed May 11, 1981, Ser. No. 262,714

Int. Cl.³ E21B *43/04*

U.S. Cl. 166—51 **31 Claims**

1. Well completion apparatus for use in a well including a well casing, said apparatus comprising a liner including a foraminous portion, support means for supporting said liner within the casing, packing means for sealing between the liner and casing above said foraminous portion, first passage means for conducting fluid from above said packing means down through the inside of said liner out of contact therewith to below said foraminous portion and thence outwardly to the exterior of the liner, second passage means for conducting fluid from below said packing means to above said packing means, and third passage means above said foraminous means for conducting fluid from outside said liner to said second passage

means, said third passage means including flow control valve means, whereby with said flow control valve means closed



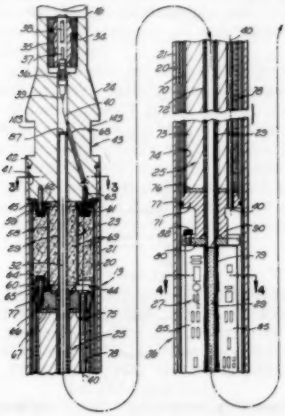
fluid can be conducted via said first passage means to the exterior of said liner and injected into the surrounding earth formation under pressure.

4,440,219

THERMALLY ISOLATED WELL INSTRUMENTS

Paul D. Engelder, Rancho Palos Verdes, Calif., assignor to AMF Inc., White Plains, N.Y.

Filed Jan. 10, 1983, Ser. No. 457,059
Int. Cl.³ E21B *36/00*
U.S. Cl. 166—57 **20 Claims**



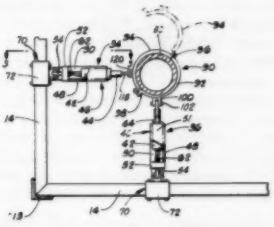
1. A thermally protected well device comprising:
a vertically elongated heat insulating jacket structure adapted to be lowered into a well;
an instrument within said jacket structure and insulated thereby from the heat of the surrounding earth formation;
a heat sink within and insulated by said jacket structure and located above said instrument;
a heat pipe having a portion extending upwardly within the jacket structure from the instrument to the heat sink and containing a liquid which only partially fills the heat pipe and acts by evaporation at a lower level and condensation at a higher level to transmit heat upwardly from said instrument to the heat sink but not downwardly therebetween;
said jacket structure including heat insulating top and bottom portions thereof located above the heat sink and beneath the instrument respectively and acting to resist conduction of heat downwardly from the exterior of the jacket structure through said top portion to said heat sink and instrument or upwardly thereto through said bottom portion; and including a heat insulating side wall structure extending about said heat sink and instrument between said top and bottom portions and resisting conduction of heat radially inwardly from the exterior of the jacket structure to the heat sink and instrument and said portion of the heat pipe extending therebetween.

4,440,220

SYSTEM FOR STABBING WELL CASING

James R. McArthur, Rte. 1, Box 50, Tishomingo, Okla. 73460

Filed Jun. 4, 1982, Ser. No. 385,035
Int. Cl.³ E21B *19/00*
U.S. Cl. 166—85 **13 Claims**



1. A system for stabbing well casing comprising:
a drilling rig mast;
a first piston and cylinder subassembly pivotally connected to the mast for pivotation about a horizontal axis between a vertically extending, inoperative position and a horizontally extending, operative position;
a clamp subassembly connected to said first piston and cylinder subassembly and including a pair of hingedly interconnected clamp jaws adapted for clampingly engaging a section of casing;
a second piston and cylinder subassembly pivotally connected to the mast for pivotation about a horizontal axis between a vertically extending, inoperative position and a horizontally extending, operative position, said second piston and cylinder subassembly extending at a right angle to said first piston and cylinder subassembly when said piston and cylinder subassemblies are pivoted to their operative, horizontally extending positions;
means connected to said second piston and cylinder subassembly for quick detachably engaging said clamp subassembly when said clamp subassembly is clampingly engaged with a casing section; and
means associated with each of said piston and cylinder subassemblies for resiliently damping lateral movement of a casing section engaged by said clamp subassembly.

4,440,221

SUBMERGIBLE PUMP INSTALLATION

Donald F. Taylor, and William G. Boyle, both of Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

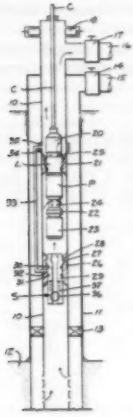
Filed Sep. 15, 1980, Ser. No. 186,980
Int. Cl.³ E21B *43/00*
U.S. Cl. 166—106 **15 Claims**

1. A submergible pump installation for a well having a tubing therein including a landing nipple comprising,
a submergible pump having a lower intake and an upper

discharge, said pump run in said tubing on means providing communication with the surface,

means for mounting and sealing the pump within the tubing, said sealing means being located between the intake end and the discharge end of said pump whereby when the pump is operating, well fluid is pumped into said intake and is discharged from said discharge end,

a subsurface safety valve having hydraulically-actuated means for controlling operation thereof,



means for independently mounting and sealing said safety valve within the tubing at a point spaced below and having no direct physical connection with the submergible pump other than through the tubing, said valve controlling flow to the inlet of said pump, and

means for conducting pressure fluid to the hydraulically-actuated means of said valve to operate said means and maintain said valve in open position when the pump is operating, said valve remaining in the tubing to prevent flow therethrough when the pump is pulled.

4,440,222

SIDE POCKET MANDREL WITH IMPROVED ORIENTING MEANS

William H. Pullin, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 24, 1982, Ser. No. 351,628
Int. Cl.³ E21B *23/03*
U.S. Cl. 166—117.5 **8 Claims**

1. An improved orienting-type side pocket mandrel, including:

a. elongate body means having a main passage therethrough;

b. connecting means on opposite ends of said body means for attachment to a string of well tubing;

c. receptacle bore means in said body means offset from and extending alongside said main passage for receiving a flow control device;

d. port means in said body means communicating said receptacle bore means with the exterior of said mandrel;

e. offset belly means in said body means above said receptacle bore means providing space for operation of a handling tool for installing a device in said receptacle bore means; and

f. an orienting sleeve in said body means for orienting said handling tool relative to said receptacle bore means, said orienting sleeve having:

i. a longitudinally extending orienting slot therein, and

ii. a pair of guide surfaces below said slot and directed upwardly toward the bottom of said slot, said pair of

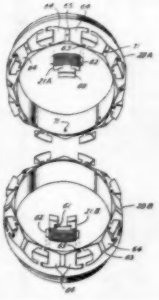
guide surfaces having their upper ends longitudinally spaced apart.

4,440,223

WELL SLIP ASSEMBLIES

Neil H. Akkerman, Kingwood, Tex., assignor to AVA International Corporation, Houston, Tex.

Division of Ser. No. 233,627, Feb. 17, 1981, Pat. No. 4,393,929.
This application Oct. 22, 1982, Ser. No. 436,001
Int. Cl.³ E21B *33/128, 33/129*
U.S. Cl. 166—217 **3 Claims**



1. A slip assembly, comprising a pair of slip bowls arranged for movement axially toward and away from one another, said bowls having expander surfaces about their outer sides which taper inwardly toward intersection with their adjacent ends, slips each having an outer gripping surface and an inner expander surface for sliding axially along an expander surface of a slip bowl as the slip bowls move toward and away from one another, and means interconnecting each slip on one bowl with at least one slip on the other bowl for axial movement with one another while permitting radial movement with respect to one another, shearble pins on the surfaces of one bowl to engage with the slips thereon in order to delay movement of the slips toward gripping positions.

4,440,224

METHOD OF UNDERGROUND FUEL GASIFICATION

Efim V. Kreinin; Kirill N. Zvyagintsev, and Nikolai A. Fedorov, all of Moscow, U.S.S.R., assignors to Vesojuzny Nauchno-Issledovatelsky Institut Ispolzovania Gaza V Narodnom Khozyaistve I Podzemnogo Khranenia Nefti, Nefteproduktov I Szhizhennykh Gazov (Vniipromgaz), U.S.S.R.

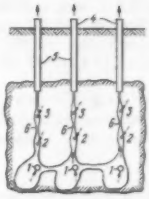
PCT No. PCT/SU78/00001, § 371 Date Jun. 21, 1979, § 102(e) Date Jun. 11, 1979, PCT Pub. No. WO79/00224, PCT Pub. Date May 3, 1979

PCT Filed Oct. 20, 1978, Ser. No. 262,071

Claims priority, application U.S.S.R., Oct. 21, 1977, 2535860

Int. Cl.³ E21B *43/243, 43/30*

U.S. Cl. 166—245 7 Claims



1. A process of underground fuel gasification, comprising the steps of

providing an underground gasification duct and a plurality of boreholes communicating with said gasification duct in material to be gasified,

igniting a portion of said material to be gasified in communication with said gasification duct so that gases resulting from the ignition pass into said gasification duct,

introducing a first oxygen-containing gas through a first of said boreholes to form generator gas and create a zone of oxygen-containing gas introduction within said gasification duct,

withdrawing said generator gas along said gasification duct away from said oxygen-containing gas introduction zone, to create a zone of generator gas withdrawal within said gasification duct, and

introducing a second gas comprising at least one of a carbon-containing gas and a hydrogen-containing gas through a second of said boreholes in said zone of generator gas withdrawal, away from said oxygen-containing gas introduction zone, to enrich said generator gas, said second gas being introduced simultaneously with said first gas,

whereby physical heat of said generator gas is substantially completely utilized and the ratio of gasified components within the generator gas is effectively controlled.

4,440,225

OIL RECOVERY USING MODIFIED HETEROPOLYSACCHARIDES IN BUFFERED BRINE

George M. Holzwarth, Linden, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 13, 1982, Ser. No. 417,439

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—246 9 Claims

1. A process for recovering crude oil from a subterranean formation which comprises injecting an amount effective to provide mobility control of an aqueous solution containing heteropolysaccharides produced by the action of bacteria of the genus Xanthomonas, driving the displaced oil through the formation and recovering the displaced oil, wherein heteropolysaccharide has been prepared by a process comprising the steps of:

(a) preparing an aqueous solution which contains (i) from about 200 to about 30,000 parts per million by weight, of a heteropolysaccharide product produced by the bacterial fermentation of bacteria of the genus Xanthomonas, and (ii) at least about 0.5 weight percent of at least one inorganic salt to obtain a saline heteropolysaccharide solution;

(b) adding a buffer, said buffer being characterized by having a pH and a buffer capacity such that the saline heteropolysaccharide solution has an initial pH of about 6.5 to 10.0 and a pH of about 6.0 to 9.5 during heating;

(c) heating said saline heteropolysaccharide solution to a temperature of at least about 100° C;

(d) maintaining said saline heteropolysaccharide solution at a temperature of at least about 100° C. for a period of time sufficient to increase the injectivity and filterability characteristics of the heteropolysaccharide;

(e) maintaining said saline heteropolysaccharide solution at a pH of from 6.0 to 9.5 during the heat treatment; and

(f) removing or separating the proteinaceous materials and/or residual whole bacterial cells or other cell debris from the saline and heat-treated heteropolysaccharide product to thereby obtain a modified heteropolysaccharide capable of imparting a viscosity of at least 4.0 centipoises to an aqueous test solution containing 2 weight percent NaCl and 0.2 weight percent $CaCl_2$ when said modified heteropolysaccharides is added to said solution at a concentration of approximately 600 parts per million, by weight, as measured on a Brookfield viscosimeter with a UL adapter at 60 rpm at 25° C. and said modified heteropolysaccharide is further capable of imparting a filterability such that more than 1000 ml of a different aqueous test solution containing 8.8 weight percent salt comprised of NaCl and $CaCl_2$ on a 10:1 weight ratio and approximately 600 parts per million concentration, by weight, of said modified heteropolysaccharide will pass without plugging through a Millipore ® filter having a diameter of 13 mm and a pore size of about 5 microns at a constant pressure drop of about 1.55 psig.

4,440,226

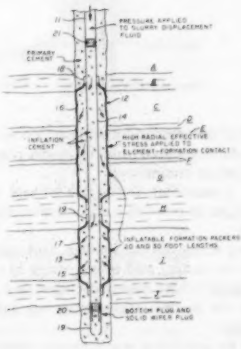
WELL COMPLETION METHOD

George O. Suman, Jr., 4200 Westheimer Rd., Suite 211, Houston, Tex. 77027

Filed Dec. 8, 1982, Ser. No. 447,873

Int. Cl.³ E21B *33/13, 33/127*

U.S. Cl. 166—250 4 Claims


PRESSURE APPLIED TO SLURRY DISPLACEMENT FLUID
PRIMARY CEMENT
INFLATION CEMENT
HIGH RADIAL EFFECTIVE STRESS APPLIED TO ELEMENT-FORMATION CONTACT
INFLATABLE FORMATION PACKERS 20 AND 50 FOOT LENGTHS
BOTTOM PLUG AND SOLID WIPER PLUG

4. A method for reducing or preventing migration of a formation fluid from a first earthen formation to a second earthen formation each of which is intersected by a drilled borehole comprising the steps of:

A. running an inflatable packer in a string of casing into the borehole to be opposite one of said formations; the packer having a mandrel connected as a part of the casing string, an outer elastic sleeve surrounding the mandrel and sealed thereto at its ends and having an unreinforced portion between its ends, and valve means for permitting flow of

cement from the interior of the sleeve into the interior of the sleeve to expand the same against said one formation;

B. determining the pore pressure of said one formation;

C. determining the radial shrinkage of cement within said sleeve;

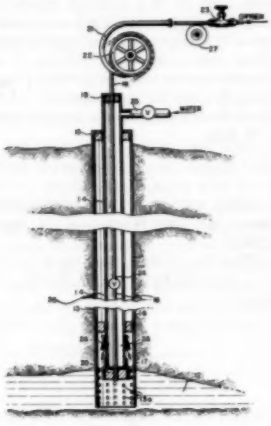
D. determining the maximum pressure which can be exerted by said sleeve on said one formation without fracturing same;

E. pumping cement down through said casing and mandrel into said sleeve at a pressure less than said maximum pressure but sufficient to resiliently strain said mandrel, sleeve and formation an amount sufficiently greater than the shrinkage of said cement during setting to provide a pressure of said sleeve against said one formation, after the cement has set, greater than the pore pressure of said one formation.

4,440,227
WELL COMPLETION FOR INJECTING HIGH PURITY OXYGEN IN A FIRE FLOODING PROCESS

Billy G. Holmes, Lancaster, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 8, 1982, Ser. No. 439,661
Int. Cl.³ E21B *43/243*
U.S. Cl. 166—261 **18 Claims**



1. A well completion for an injection well in a field in which hydrocarbons are recovered by in-situ combustion in a subsurface formation comprising:

a casing extending the length of said well and containing passages to provide fluid communication with the formation;

a tubing string disposed within said casing;

means for seating said tubing string in said casing;

continuous tubing disposed within said tubing string;

means for seating said continuous tubing in said tubing string;

means for supplying water to said tubing string;

means for supplying oxygen to said continuous tubing; and

a check valve near the bottom of said continuous tubing to allow oxygen to enter said formation through said continuous tubing and to prevent unreacted oxygen in said formation from traveling up said continuous tubing.

13. The method of establishing a combustion zone from an injection well in a field in which hydrocarbons are recovered by in-situ combustion in a subsurface formation comprising:

disposing a tubing string within said well and into said formation;

seating continuous tubing within said tubing string so that the bottom of said continuous tubing is in proximity to said formation;

supplying water to said formation through said tubing string;

supplying oxygen to said formation through said continuous tubing;

supplying oxygen to said formation through a check valve in said continuous tubing to prevent unreacted oxygen in said formation from traveling up said continuous tubing.

4,440,228
GELLED COMPOSITIONS AND WELL TREATING

Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 175,811, Aug. 6, 1980, Pat. No. 4,323,123, which is a division of Ser. No. 925,357, Jan. 20, 1981, Pat. No. 4,246,124. This application Jan. 28, 1982, Ser. No. 343,638
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—274 **9 Claims**

1. A process for displacing oil within a subterranean formation penetrated by at least one well which comprises:

injecting into the formation a gel forming composition comprising

(a) water,

(b) a water-thickening amount of a water-dispersible polymer selected from the group consisting of cellulose ethers, polyacrylamides and biopolysaccharides or heteropolysaccharides produced by the action of bacteria of the genus Xanthomonas upon carbohydrates,

(c) a small, but effective amount in the range of 0.02 to 2 weight percent of at least one aldehyde component selected from the group consisting of aliphatic monoaldehydes having from 1 to about 10 carbon atoms per molecule, glyoxal, glutaraldehyde, and terephthaldehyde, and

(d) a small, but effective amount in the range of 0.005 to 2 weight percent of at least one phenolic compound selected from the group consisting of phenol, catechol, resorcinol, phloroglucinol, pyrogallol, 4,4'-diphenol, 1,3-dihydroxynaphthalene, 1,4-benzoquinone, hydroquinone, quinhydrone, and quebracho which amounts of aldehyde (c) and phenolic compound (d) are sufficient to cause gelation of an aqueous dispersion of polymer (b) and form said gelled composition,

at a pressure or rate insufficient to create cracks or fractures in the formation but sufficient to force said composition into the more permeable portions of the formation to reduce the permeability of same and

introducing into the formation a drive fluid at a pressure and rate sufficient to force oil from the less permeable oil-rich zones to the surface, thereby increasing oil production and/or reducing the water/oil ratio of the production well.

4,440,229
OIL WELL SERVICING PROCESSES

Julius G. Burch, 822 S. McGee, Borger, Tex.

Filed Jun. 22, 1982, Ser. No. 390,812
Int. Cl.³ E21B *37/02*
U.S. Cl. 166—311 **3 Claims**

1. In the process of producing and maintaining a paraffin-producing oil well, the steps of:

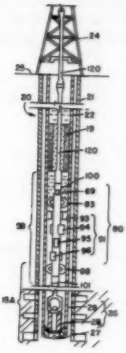
(a) adding to a sucker rod string with a pump plunger at the end thereof, said rod string located in a tubing, an array of vertically extending cutting blades each with an upwardly directed sharp cutting edge, each said cutting edge extending circumferentially of said rod string for a sector of a circle and each of said upwardly directed cutting edges bevelled inwardly and downwardly adjacent and located close to the interior surface of said tubing and resiliently urged against said tubing wall, said blades longitudinally spaced apart from each other along the length of said rod string,

(b) locating said sucker rod string and array of cutting blades

in an oil well tubing in said paraffin-producing well, with said pump plunger in a pump barrel therefor at the bottom of said tubing,

(c) producing said well and forming a paraffin deposit on the inner surface of said tubing,

(d) lifting said pump plunger and rod string from said well while concurrently and automatically locating said cutting edges adjacent the inner wall of said tubing with the side edges of each said blade overlapping the side edge of two other blades of said array of blades as seen in a plane transverse to the length of said rod string and the totality



of such cutting edges forming at least a complete circle and thereby shaving said paraffin deposit inwardly and away from and off said inner surface of the tubing while the tubing is full of well fluid, and then

(e) replacing the pump plunger in said combination of said rod string and said array of cutting blades with a different pump plunger and locating said rod string and said array of blades in said tubing and said pump plunger in said pump barrel,

(f) and again producing said well and forming a paraffin deposit on the interior surface of said tubing.

4,440,230

FULL-BORE WELL TESTER WITH HYDROSTATIC BIAS

Howard L. McGill, Lufkin, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 23, 1980, Ser. No. 220,240

Int. Cl.³ E21B *34/06*

U.S. Cl. 166—321 **4 Claims**

1. A fluid pressure controlled well tester apparatus comprising: housing means adapted for connection to a pipe string and having a flow passage extending therethrough for conducting formation fluids from an isolated formation interval; full-opening valve means for opening and closing said flow passage; a stepped-diameter mandrel that is longitudinally movable and sealingly slidable within said housing means; first seal means between a lesser diameter portion of said mandrel and said housing means and second seal means between a greater diameter portion of said mandrel and said housing means, said first and second seal means being arranged to define an atmospheric chamber for maintaining a quantity of gas at less than the annulus hydrostatic head pressure; and means subjecting a transverse cross-sectional area of said mandrel to changes in the pressure of fluids in the well annulus for moving said mandrel to shift said valve means between closed and open positions in such manner that movement of said mandrel to the

valve open position will cause expansion of said atmospheric chamber to bias the mandrel in the valve closed position.

4,440,231

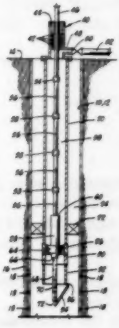
DOWNHOLE PUMP WITH SAFETY VALVE

Albert E. Martin, Ratliff City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Jun. 4, 1981, Ser. No. 270,332

Int. Cl.³ E21B *34/16*

U.S. Cl. 166—373 **9 Claims**



1. A downhole pump assembly, comprising:

a tubing string;

a seating means, connected to a lower end of said tubing string, for seating a downhole pump;

tubing extension means connected to said seating means and extending downward therefrom;

valve means connected to said tubing extension means for selectively opening and closing said tubing extension means to thereby communicate an interior of said tubing string with and isolate said interior of said tubing string from a well bore;

a pump adapted to seat in said seating means; and

valve actuating means, associated with said pump, for opening and holding open said valve means when said pump is seated in said seating means and for closing said valve means when said pump is unseated from said seating means.

8. A method of installing a rod pump in a well, said method comprising the steps of:

providing a flapper valve means on a lower end of a tubing extension below a seating means connected to a production tubing string suspended in said well;

attaching said rod pump to a lower end of a sucker rod string, said sucker rod string having a polished rod at an upper end thereof;

attaching a dip tube to a lower end of said rod pump;

lowering said sucker rod string, rod pump, and dip tube into said production tubing to a first position wherein a lower end of said dip tube is above said flapper valve;

sealing said polished rod within a stuffing box attached to an upper end of said production tubing; and then

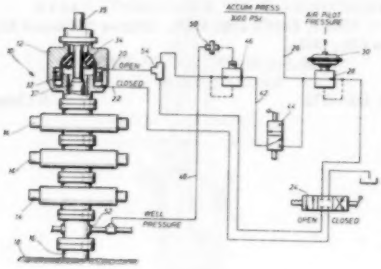
further lowering said sucker rod string and thereby pushing said flapper valve open with said dip tube and then seating said rod pump in said seating means.

4,440,232

WELL PRESSURE COMPENSATION FOR BLOWOUT PREVENTERS

Joseph L. LeMoine, Houston, Tex., assignor to Koomey, Inc., Houston, Tex.

Filed Jul. 26, 1982, Ser. No. 401,808
Int. Cl.³ E21B *33/06*
U.S. Cl. 166—373 **6 Claims**



1. In a blowout preventer control system having an opening line and a closing line connected to a control valve which is connected to a fluid supply line, the improvement of compensation means for reducing the effects of well bore pressure comprising,

a compensating line connected between the fluid supply line and the opening line,

a control means in the compensating line for applying an opening force on the blowout preventer,

a pilot control pressure regulator in the compensating line, and

a pilot control line connected between the regulator and the well pressure in the blowout preventer whereby the output pressure of the regulator is proportional to the well pressure for compensating for the closing force on the blowout preventer caused by the well pressure.

4. The method of compensating for the closing force on a blowout preventer caused by well pressure when withdrawing a drill string through a closed blowout preventer comprising,

when withdrawing a drill string through a closed blowout preventer applying a hydraulic closing force to the blowout preventer from an external fluid supply source for closing the blowout preventer on the drill string, and

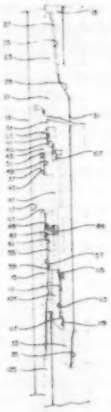
applying a hydraulic opening force to the blowout preventer actuated by and proportional to the well pressure for reducing wear on the blowout preventer.

4,440,233

SETTING TOOL

John L. Baugh, and Melvin J. Hardy, both of Huntsville, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Jul. 6, 1982, Ser. No. 395,211
Int. Cl.³ E21B *23/02*
U.S. Cl. 166—382 **9 Claims**



1. A setting tool of the type adapted to be made up in a pipe string for releasably engaging a setting sleeve in a well bore, comprising:

a mandrel having an upper end adapted to be connected in the pipe stirng, a lower end, and an intermediate supporting shoulder formed on the exterior of said mandrel;

a generally cylindrical setting nut carried on said mandrel, said nut having external connecting threads for engaging mating internal connecting theads on the interior of a setting sleeve disposed about the lower end of said mandrel and said setting nut having at least one axial groove in the interior thereof:

said mandrel being slidably disposed within said setting nut when said nut is engaging said setting sleeve, said mandrel being slidable between an extended runnin-in position and a weight set-down position wherein said supporting shoulder contacts said setting sleeve;

said setting nut having at least one opening in a sidewall thereof for receiving a dog and wherein said setting sleeve interior has a radial groove adapted to engage said dog for preventing relative movement between said connecting threads of said setting nut and said setting sleeve when said mandrel is in said extended running-in position and allowing relative movement between said connecting threads when said mandrel is in said weight set-down position; and

at least one torque transmitting spline on said mandrel exterior adapted to be received within said setting nut axial groove whereby torque transmitted to said mandrel is transmitted to said setting nut.

4,440,234

SPRINKLER

Edward T. Shea, Huntington, N.Y., assignor to The Reliable Automatic Sprinkler Company, Inc., Mt. Vernon, N.Y.

Continuation of Ser. No. 585,966, Jun. 11, 1975, abandoned. This application Sep. 13, 1976, Ser. No. 722,766
Int. Cl.³ A62C *37/08*
U.S. Cl. 169—39 **36 Claims**

1. In a sprinkler having a frame with first and second ends, an orifice for discharging fluid at the first end of the frame, and a cap over the orifice for normally preventing discharge of

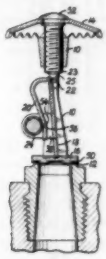
fluid from the orifice, compression means at the second end of the frame, a structure positioned between the cap and the second end of the frame for releasably retaining the cap over the orifice, which structure comprises:

a strut member engaging the cap,

a lever member engaging the compression means at the second end of the frame,

the strut and lever members being pivotally engaged and having adjacent portions tending to move away from each other in response to compressive force applied to the structure between the cap and the compression means at the second end of the frame,

a pair of arms affixed to and extending in spaced relation away from the strut member in the direction of and straddling the adjacent portion of the lever member,



a tubular retainer normally held between the pair of arms and engaging the straddled portion of the lever member, eutectic means within the tubular retainer, and

arm-engaging means projecting from the tubular retainer and normally engaging one of the pair of arms to normally hold the tubular retainer in position to engage the straddled portion of the lever member but responsive to melting of the eutectic means to move inwardly in the tubular retainer, permitting the retainer to be released from the pair of arms and allowing the straddled portion of the lever member to move away from the adjacent portion of the strut member and release of the cap from its position over the orifice.

4,440,235

ROCK WINDROWER

Vincent Colistro, Humboldt, Canada, assignor to Schulte Industries Ltd., Englefeld, Canada

Filed Jul. 12, 1982, Ser. No. 397,078

Int. Cl.³ A07B *43/00*

U.S. Cl. 171—63 **9 Claims**

1. A rock windrower assembly comprising in combination a chassis, a hitch assembly on the front end thereof and adjustable ground engaging wheels mounted at the rear end thereof to support said chassis, a transversely situated rock windrower drum component, a transverse support mounted across said chassis for partial rotation therein, arms extending from adjacent each end thereof to support said drum component for rotation, said drum component moving freely in an arc around the axis of said transverse support, and means operatively connected between said chassis and said transverse support to raise said drum clear of the ground for transport purposes, said drum moving downwardly and engaging the ground by gravity, said last mentioned means also controlling the limit of the downward movement of said drum component, said means operatively connected between said chassis and said transverse support including at least one crank arm having ends and secured by one end thereof to said transverse support means and extending perpendicularly therefrom, a floating cylinder lug pivoted intermediate said ends thereof to said chassis and a hydraulic piston and cylinder assembly operatively extending between the other end of said crank arm and one end of said floating cylinder lug, stop means on said chassis restricting the movement of the other end of said floating cylinder lug rearwardly, extension of said piston and cylinder assembly raising said drum component to a transport position, retraction of said piston and cylinder assembly lowering said drum component to a field working position and limiting the working depth of said drum component, said piston and cylinder assembly acting as a rigid link when positioned whereby said drum component, said crank arm, said piston and cylinder assembly and said floating cylinder lug all pivot around said transverse support means as one unit whereby said drum component lifts if said drum component engages an obstruction within the ground and whereby the weight of said drum component and said arms returns said drum component to the preset working position, and means to detachably lock said floating cylinder lug to said chassis in a no-float relationship, whereby retraction of said piston and cylinder assembly engages said drum component with the ground and further retraction raises said chassis for chassis levelling.

4,440,236

HYDRAULIC CONTROL SYSTEM FOR A ROCK DRILL

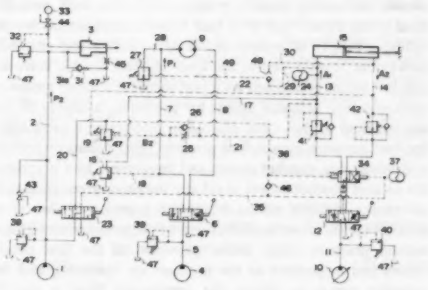
Takeo Shiihara; Toshihiro Niihara; Hidemi Iwata, and Noboru Ishii, all of Hiroshima, Japan, assignors to Toyo Kogyo Co. Ltd., Hiroshima, Japan

Continuation of Ser. No. 187,639, Sep. 16, 1980, abandoned. This application May 5, 1983, Ser. No. 489,608

Claims priority, application Japan, Sep. 20, 1979, 54-121527; Sep. 20, 1979, 54-121528

Int. Cl.³ B23Q *5/033*; E21C *5/16*

U.S. Cl. 173—8 **8 Claims**



1. A rock drill comprising drilling rod means, striking actuator means for applying striking movements to said drilling rod means, reversible rotary actuator means for rotating the drilling rod means, reversible feed actuator means for advancing and retreating said drilling rod means, first fluid pump means, first conduit means connecting said first fluid pump means with said striking actuator means for providing a supply of pressurized fluid to the striking actuator means to produce the striking movements of the striking actuator means, second fluid pump means, second conduit means connecting said second fluid pump means with said rotary actuator means for providing a supply of pressurized fluid so that a positive driving rotation is produced in the rotary actuator means, third fluid pump means, advancing conduit means connected with said third

fluid pump means and with said feed actuator means for providing a supply of pressurized fluid so that a rod advancing movement is produced in the feed actuator means, retreating conduit means connected with said third fluid pump means and with said feed actuator means for providing a supply of pressurized fluid so that a rod retreating movement is produced in the feed actuator means, first pressure relief means provided in said advancing conduit means and responsive to a pressure in the second conduit means to relieve the pressurized fluid in the advancing conduit means when the pressure in the second conduit means is increased beyond a first predetermined value, second pressure relief means provided in the first conduit means and responsive to a pressure difference between the advancing and retreating conduit means to relieve the pressurized fluid in the first conduit means when the pressure in the advancing conduit is not higher than that in the retreating conduit by a second predetermined value, pressure accumulating means connected through check valve means with said first conduit means for accumulating a pressure drawn from said first conduit means, switching valve means provided in said advancing and retreating conduit means and responsive to a pressure difference between said first conduit means and said accumulating means for changing the direction of movement of said feed actuator means when the pressure in the first conduit means is lower than that of said accumulating means by a third predetermined value.

8. A rock drill comprising drilling rod means, striking actuator means for applying striking movements to said drilling rod means, reversible rotary actuator means for rotating the drilling rod means, reversible feed actuator means for advancing and retreating said drilling rod means, first fluid pump means, first conduit means connecting said first fluid pump means with said striking actuator means for providing a supply of pressurized fluid to the striking actuator means to produce the striking movements of the striking actuator means, second fluid pump means, second conduit means connecting said second fluid pump means with said rotary actuator means for providing a supply of pressurized fluid so that a positive driving rotation is produced in the rotary actuator means, third fluid pump means, advancing conduit means connected with said third fluid pump means and with said feed actuator means for providing a supply of pressurized fluid so that a rod advancing movement is produced in the feed actuator means, retreating conduit means connected with said third fluid pump means and with said feed actuator means for providing a supply of pressurized fluid so that a rod retreating movement is produced in the feed actuator means, first pressure relief means provided in said advancing conduit means and responsive to a pressure in the second conduit means to relieve the pressurized fluid in the advancing conduit means when the pressure in the second conduit means is increased beyond a first predetermined valve, second pressure relief means provided in the first conduit means and responsive to the pressure for operating said feed actuator means to relieve the pressurized fluid in the first conduit means when the pressure in the feed actuator means is lower than a second predetermined value, so that advancing and striking forces on the drilling rod means are weakened when the pressure in the second conduit means is increased due to an increase in driving torque on the driving rod means, pressure accumulating means connected through check valve means with said first conduit means for accumulating a pressure drawn from said first conduit means, switching valve means provided in said advancing and retreating conduit means and responsive to a pressure difference between said first conduit means and said accumulating means for changing the direction of movement of said feed actuator means when the pressure in the first conduit means is lower than that of said accumulating means by a third predetermined value.

4,440,237

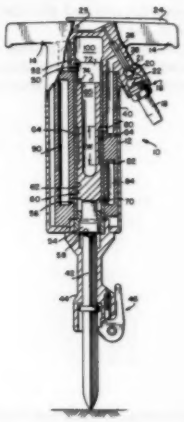
PAVEMENT BREAKER

John J. Casperovich, Bethlehem, Pa., assignor to Ingersoll-Rand Co., Woodcliff Lake, N.J.

Filed Jun. 11, 1982, Ser. No. 387,694

Int. Cl.[3] **F01L** *25/02*

U.S. Cl. 173—134 **10 Claims**



1. A valveless pavement breaker comprising;

(a) a housing;

(b) an inlet means for introducing compressed gas into said housing;

(c) a piston chamber formed in said housing having a first section and a second section;

(d) a piston having a circumferential recess about the middle and arranged for longitudinal reciprocating movement within said piston chamber between said first and second sections;

(e) a first expansion chamber communicating with said first section of said piston chamber;

(f) a first vent port arranged for venting said first section of said piston chamber when said piston is positioned toward said second section of said piston chamber;

(g) a first passage communicating with said first section of said piston chamber and arranged so that when said piston is positioned toward said first section of said piston chamber said first passage is in communication with said circumferential recess whereby said compressed gas from said inlet means moves said piston toward said second section of said piston chamber;

(h) a second expansion chamber in said piston continuously communicating with said second section of said piston chamber;

(i) a second vent port arranged for venting said second section of said piston chamber when said piston is positioned toward said first section of said piston chamber;

(j) a second passage communicating with said second section of said piston chamber and arranged so that when said piston is positioned toward said second section of said piston chamber said second passage is in communication with said circumferential recess whereby said compressed gas from said inlet means moves said piston toward said first section of said piston chamber; and

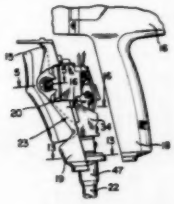
(k) means for attaching a breaker tool to said housing.

4,440,238

SWITCH AND HANDLE CONSTRUCTION FOR DOUBLE-INSULATED ELECTRIC TOOL

William D. Sauerwein, Westminster, and Lynn E. Lentino, Finksburg, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Nov. 2, 1981, Ser. No. 317,061
Int. Cl.³ B23B 45/14
U.S. Cl. 173—170 6 Claims



1. A double-insulated power tool, comprising:
(a) a field case formed of electrically insulating material and including an integral depending handle portion;
(b) an electric motor mounted in the field case;
(c) a replaceable switch having a switch body and an actuating member for controlling the motor;
(d) mounting means for connecting the switch to the tool;
(e) the mounting means including a subassembly having a switch cover, a trigger, and a mounting bracket, all being formed of electrically insulating material;
(f) the switch cover having a back and a front, and being removably secured to the handle portion forwardly thereof;
(g) the back of the switch cover defining a recess, and further defining an opening formed in the recess through the cover;
(h) the switch being located in the switch cover recess with the actuating member protruding through the opening;
(i) the trigger being coupled to the actuating member, and further being pivotally mounted on the switch cover adjacent the front thereof in overlying relation to the actuating member;
(j) the mounting bracket being connected in overlying relation to the switch;
(k) an electrical supply cable entering the tool adjacent the handle portion and including at least two electrical conductors;
(l) the mounting bracket including guiding means for orienting an unbroken electrical conductor from the cable entry to the field case, interior of the switch cover and the handle portion;
(m) the mounting bracket further including two transverse members joined by an elongated strap member; and
(n) the transverse members engaging the switch body.

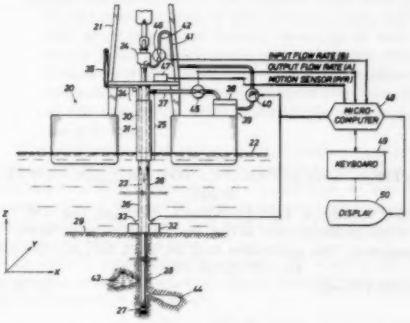
4,440,239

METHOD AND APPARATUS FOR CONTROLLING THE FLOW OF DRILLING FLUID IN A WELLBORE

John L. Evans, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Sep. 28, 1981, Ser. No. 306,252
Int. Cl.³ E21B 47/10
U.S. Cl. 175—5 43 Claims

42. A method for controlling the flow of drilling fluid through a subaqueous wellbore while drilling from a floating vessel, comprising the steps of:
measuring the output flow rate (A) of the drilling fluid from the wellbore and the input flow rate (B) of the drilling fluid to the wellbore;
calculating in a computer a delta flow rate (D) by subtracting the input flow rate (B) from the output flow rate (A);
comparing in a computer the absolute value of the delta flow rate (D) with an alarm limit (C) so as to generate a warning indicating that the flow of drilling fluid is out of control when the comparison indicates that the absolute value of the delta flow rate (D) exceeds the alarm limit (C); and
filtering in the computer the value of at least one of the parameters (A) and (D) to reduce or minimize the effect of the vessel's motion on the generation of said warning;



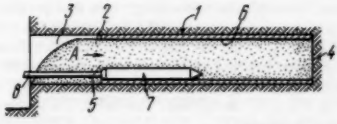
wherein at least a component of the pitch and roll (P/R) of the vessel is measured and the alarm limit (C) is set equal to a maximum alarm limit if the pitch and roll (P/R) measured value exceeds a pitch/roll limit, or equal to a roughness output (A_r) which varies proportionally with the roughness of the sea between a minimum alarm limit and the maximum alarm limit if the pitch and roll (P/R) measured value does not exceed the pitch/roll limit.

4,440,240

METHOD OF MAKING HOLES IN THE SOIL AND APPARATUS FOR PERFORMING THIS METHOD

Alexandr D. Kostylev; Vladimir P. Gileta; Vladimir A. Grigoraschenko; Khaim B. Tkach, all of Novosibirsk; Vladimir A. Bakunin, Odessa; Valery Y. Frenkel, Moscow; Valery A. Kozlov, Novosibirsk; Jury B. Reifisov, Novosibirsk; Nikolai P. Chepurnoi, Novosibirsk; Mikhail J. Bondar, Odessa; Vladimir F. Drobyazko, Odessa; Stanislav B. Stazhevsky, Novosibirsk; Gerald I. Ratskevich, Novosibirsk; Alexandr A. Fedorov, Novosibirsk; Anatoly S. Polyakov, Moscow; Leonid M. Bobylev, Moscow; Evgeny N. Tsvetkov, Odessa, and Anatoly M. Petreev, Novosibirsk, all of U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, Novosibirsk, U.S.S.R.

Filed May 18, 1981, Ser. No. 264,684
Claims priority, application U.S.S.R., Jan. 4, 1979, 2706741
Int. Cl.³ E21B 7/26, 11/02
U.S. Cl. 175—20 32 Claims



1. A method of making holes in soil, including the steps of:
driving a capsule into the soil by percussive action;
filling the capsule with the soil;
continuing driving said capsule into the soil by the percussive action, following its filling with the soil, while passing the soil therethrough;
withdrawing said capsule from the hole thus made, simulta-

neously with removing from the hole the soil that has passed through said capsule, and

removing the soil from said capsule itself.

3. An apparatus for making holes in soil, comprising: a capsule receiving the soil therein, and having a longitudinal axis, a first end face open in the soil intake direction, and a second end face opposite to said first end face and being at least partly open; and a percussion mechanism having a head portion and a tail portion and being attached to an inner surface of said capsule.

4,440,241

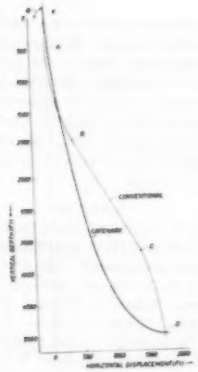
METHOD AND APPARATUS FOR DRILLING A WELL BORE

Edward O. Anders, 1502 Tallulah Ct., Houston, Tex. 77077

Continuation-in-part of Ser. No. 19,175, Mar. 9, 1979, abandoned. This application Aug. 24, 1981, Ser. No. 294,497

Int. Cl.³ E21B *7/04, 7/08*

U.S. Cl. 175—61 **13 Claims**



8. Apparatus for drilling between two points a well bore that is inclined from the vertical and has a substantially constantly increasing dip angle using a drill bit at the lower end of a drill string, comprising a bit stabilizer located in the drill string adjacent the drill bit, a string stabilizer located in the drill string a preselected distance above the bit stabilizer, a telescoping joint located in the string between the two stabilizers to allow the length of the drill string between the two stabilizers to increase as the bit continues to drill, and means in the telescoping joint to produce a pressure drop in the drilling mud pumped through the telescoping joint that produces a preselected compressive force in the drill string between the two stabilizers to provide the desired weight on the bit and to cause a preselected bending of the drill string between the stabilizers to cause the bit to tend to increase the dip angle of the well bore as the distance between the stabilizers increases and the bending increases.

10. A method of drilling a borehole into a subsurface earth formation, comprising: drilling a borehole into said formation from a location horizontally and vertically displaced from said formation and along a path at least a portion of which is defined by the curve of a catenary, and extending said borehole further through said formation along a substantially horizontal path of travel.

4,440,242

DEVICE FOR PRODUCING BOREHOLES IN COAL OR THE LIKE

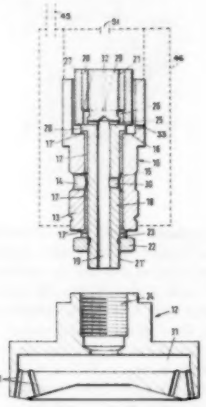
Bruno H. Schmidt, Niederkasseler Kirchweg 34, 4000 Düsseldorf, and Helmut Becker, Grosser Schirmkamp 17, 4300 Essen, both of Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 327,891

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 3044263

Int. Cl.³ E21B *7/18*

U.S. Cl. 175—107 **16 Claims**



1. Hydraulic drilling apparatus comprising:

casing means, said stator means having an axis, said stator means defining at least a first fluid flow path;

means coupling said casing means to a source of pressurized fluid; and

rotor means positioned coaxially with respect to said casing means, said rotor means having a cutting head at a first end thereof, said cutting head defining a plurality of nozzles which discharge cutting jets from a face thereof, whereby fluid cutting of a medium impinged upon by said jets will be induced, said rotor means further defining a plurality of discharge ports at the end thereof disposed oppositely with respect to said cutting head, at least some of said ports being oriented to provide fluid streams having a component of motion which is angularly related to said axis whereby rotational force will be generated and said rotor means will be caused to rotate relative to said casing means, at least one of said ports being oriented to provide a fluid stream having an axial component of motion whereby an axial force in opposition to axial forces imposed on said rotor as a result of the discharge of said cutting jets will be generated, said generated axial force being substantially equal to said axial forces resulting from the discharge of said cutting jets, said rotor means additionally defining flow passages which establish fluid communication between said casing means defined flow path and said nozzles and ports.

4,440,243

DRILL CUTTINGS CONVEYING HEAD WITH WET CUTTINGS DIVERTER

D. Franklin Howeth, 233 Chuck Wagon Trail, Forth Worth, Tex. 76108

Continuation-in-part of Ser. No. 223,036, Jan. 7, 1981. This application Dec. 14, 1981, Ser. No. 330,134

Int. Cl.³ E21B *21/06*; E21C *7/02*

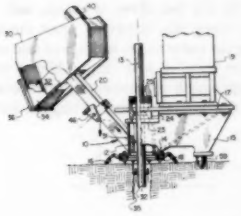
U.S. Cl. 175—209 **11 Claims**

1. Apparatus for conveying drill cuttings material entrained

in a bailing air flowstream emanating from a drillhole comprising:

a head member defining a flow passage for receiving said flowstream from the mouth of said drillhole, said head member including a lower peripheral edge;

a duct portion of said head member extending substantially upward at an acute angle with respect to the longitudinal axis of said flow passage in said head member for conducting said flowstream to a drill cuttings separation chamber disposed remote from said drillhole;



and

means operable for diverting at least a major portion of said flowstream from said duct portion and to the exterior of said head member to prevent clogging of said passage with said material, said means for diverting said flowstream including means for closing off said duct portion between said peripheral edge of said head member and said chamber.

4,440,244

DRILL TOOL

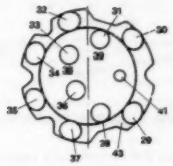
Harry A. I. Wiredal, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

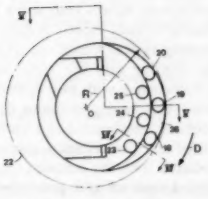
Filed Feb. 25, 1981, Ser. No. 237,914

Claims priority, application Sweden, Mar. 26, 1980, 8002320

Int. Cl.³ E21B *10/30, 10/56*

U.S. Cl. 175—292 **11 Claims**





5. A drill tool for rotary and/or percussion drilling, said drill tool being mountable upon a drill rod for travel within a tubular casing, said drill tool comprising:

a centric cutting bit provided with inner cutting means, and

an eccentric reamer cutter provided with outer cutting means, said reamer cutter positioned longitudinally rearwardly of said cutting bit and being shiftable relative thereto between a drilling position in which said reamer cutter protrudes laterally beyond the tubular casing, and a retracted position in which said reamer cutter is retracted radially within the tubular casing as viewed longitudinally, said outer cutting means comprising first and second portions,

said first portion including a first button insert defining the leading cutter of said first portion, said first insert being inclined relative to the longitudinal axis of the drill tool and peripherally arranged to define the diameter of the hole to be drilled,

said second portion including a second button insert defining the leading cutter of said second portion, said second insert positioned radially inwardly of said first button insert so as to work an annular core which is formed between a pilot hole drilled by the cutting bit and said first insert, said second insert positioned ahead of said first button insert in the rotational direction of the drill tool.

10. A drill tool according to claim **5**, wherein a wear protection means in form of a button insert of hard material, such as cemented carbide, is arranged on the envelope surface of the reamer cutter in front of the first button insert when seen in the rotational direction of the drill tool during drilling and axially behind said first button insert.

11. A drill tool according to claim **10**, wherein the wear protection means is arranged circumferentially between the first and second button insert.

4,440,245

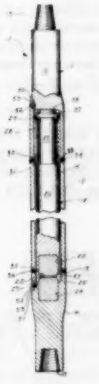
GRAVITY PERCUSSION DRILL WITH UPPER END COCKING SPRING AND METHOD OF ASSEMBLY

Allen E. Bardwell, P.O. Box 507, High Knob Estates, Front Royal, Va. 22630

Filed Jun. 17, 1982, Ser. No. 389,373

Int. Cl.³ E21B *4/08*

U.S. Cl. 175—293 **18 Claims**



1. A multiple-blow gravity drill structure for carrying a drill bit, the drill structure comprising:

an elongated tubular casing wiht an enclosed longitudinal bore and with an anvil at the lower end of the bore;

a hammer disposed in the bore and of shorter length than the bore for reciprocating movement therein, the hammer having a lateral projection near its upper end and an anvil at its lower end;

a restriction within the bore towards the upper end of the hammer, the restriction allowing the hammer to slide by; and

a spring with one end supported by the restriction within the bore and with an opposite end supporting the hammer by its lateral projection in a position where the spring is cocked against the restriction by a portion of the casing

that is urged against the upper end of the hammer and where the anvil at the lower end of the hammer is spaced apart by a gap from the anvil at the lower end of the bore, the spring yielding upon the dropping of the drill structure to a point of initial impact to allow the hammer to close the gap between the anvils and provide a follow-up impact through the lower end of the drill structure.

4,440,246

CUTTING MEMBER FOR ROTARY DRILL BITS

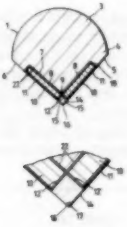
Rainer Jürgens, Altencelle, Fed. Rep. of Germany, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Mar. 24, 1982, Ser. No. 361,305

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114749

Int. Cl.³ E21B *10/46*

U.S. Cl. 175—329 **6 Claims**



1. A cutting member for rotary drill bits comprising a carrier member having a support face consisting of two component supporting faces adjoining one another in a wedge-shaped to form a front edge, each of the two component supporting faces mounting a supporting member occupying its full area and having on its front face a polycrystalline diamond cutting layer, and wherein the adjacent edges of the supporting members have marginal faces extending at right angles to their front and their back and a separate insert of hard material is disposed in a gusset remaining between these.

4,440,247

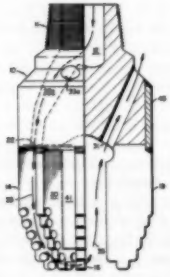
ROTARY EARTH DRILLING BIT

Raymond W. Sartor, 112 Hackberry, Red Oak, Tex. 75154

Filed Apr. 29, 1982, Ser. No. 372,898

Int. Cl.³ E21B *10/60*

U.S. Cl. 175—393 **24 Claims**



1. In a rotary earth drilling bit, the combination comprising:

a body portion adapted to be secured to a rotary drill member,

a first array of radially divergent blades depending from said body portion, said blades having outer edges which taper upwardly and outwardly from their tips to the periphery of said bit and inner edges which taper upwardly and inwardly and converge at the axis of said bit to define a conically shaped core volume at the bottom of said bit,

a plurality of cutting blanks having upset cutting surfaces spaced along the outer and inner edges of said blades and oriented at a side rake angle relative to said blades,

a second array of radially divergent blades depending from said body portion and interposed between the blades of said first array, the blades of said second array having outer edges which conform generally to the outer edges of said first array blades and having inner edges which terminate at locations radially spaced from the axis of said bit to define a core volume which is greater than the core volume defined by the first array of blades, and

a plurality of cutting blanks having upset cutting surfaces located along the outer edges and tips of said second array blades, at least some of said cutting blanks oriented at a side rake angle which is opposed with respect to the side rake angle of the corresponding cutting blanks on said first array blades.

4,440,248

BAR CODE PRINTER

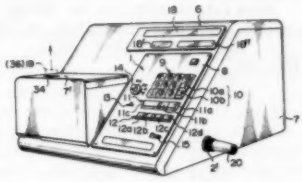
Kazuharu Teraoka, Tokyo, Japan, assignor to Teraoka Seikosho Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1981, Ser. No. 231,363

Claims priority, application Japan, Feb. 9, 1980, 55-15102; Feb. 9, 1980, 55-15103; Feb. 19, 1980, 55-19861; Feb. 20, 1980, 55-21729[U]; Jul. 18, 1980, 55-98880; Jul. 18, 1980, 55-98881; Oct. 4, 1980, 55-138891

Int. Cl.³ G01G *23/38*; G06K *7/10*; G01D *9/00*

U.S. Cl. 177—4 **4 Claims**



1. A bar code printer for producing bar code labels, comprising:

an input unit means for introducing required input data into said bar code printer, said input data including prescribed numerals, and developing an input signal of prescribed form in accordance therewith;

signal control system means responsive to said input signal for developing control signals in response thereto;

bar code printing system means responsive to said control signals for printing said bar code labels in a specified format in accordance with said control signals,

said bar code labels having columns designated as a fixed part and columns designated as a variable part,

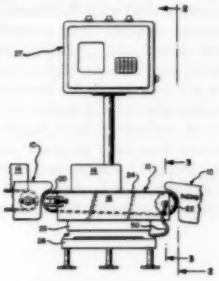
selected ones of said prescribed numerals in said input data being associated with the columns for the fixed part, and other selected ones of said prescribed numerals in said input data being associated with the columns of the variable part in response to identification by said input data introduced via said input unit means and an indicating system operatively responsive to said signal control system with display means responsive to said control signals for displaying the identified column numbers of the columns of the variable part, as distinguished from the fixed part.

4,440,249

MOTORIZED WEIGHING CONVEYOR

Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Feb. 5, 1982, Ser. No. 346,257
Int. Cl.³ G01G 19/00; H02K 3/50
U.S. Cl. 177—145 2 Claims



1. In a commodity weighing conveyor system which includes a support base, a weight-sensing device on said support base, a frame carried by said weight-sensing device and an endless conveyor belt mounted on said frame, the improvement comprising means for substantially eliminating weighing errors incidental to operation of said conveyor belt wherein:

said frame includes upstanding side walls, a first roller journalled between said side walls and a drive roller in spaced parallelism to said first roller, said conveyor belt being trained over said rollers, said drive roller including a cylindrical shell closed at one end by an end bell having a transverse wall spaced from said one end of the shell to define and end pocket therewith, said transverse wall having a centrally disposed hub provided with a bore opening into said pocket and having at least one keyway, an electric motor disposed within said pocket and including a stator and a rotor, said stator having a hollow support post extending axially of said shell and through one of said upstanding side walls and secured thereto whereby to fix said stator to said frame, said rotor having an axially extending drive shaft fixed thereto and projecting into said bore in keyed relation thereto whereby to rotatably drive said end bell directly and in unison with said rotor, and electrical connector means projecting through said hollow support post for energizing said motor.

4,440,250

WEIGHING SCALE HAVING A HYDRAULIC DAMPER INTERCOUPLED BETWEEN THE LOAD RECEIVER AND THE MEASURING CELL

Max Sigg, Weisslingen, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Feb. 5, 1982, Ser. No. 346,179
Claims priority, application Switzerland, Oct. 16, 1981, 6616/81
Int. Cl.³ G01G 21/10
U.S. Cl. 177—187 4 Claims

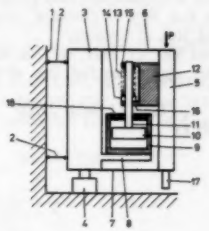
1. Weighing scale comprising

load receiving means;

force measuring means for furnishing an indication of the magnitude of force applied thereto, said force measuring means having a force receiving member, the force applied to said force measuring means being limited to a maximum allowable force;

damping means for suppressing oscillations of said load receiving means, said damping means comprising a hydraulic damper;

means for intercoupling said damping means between said load receiving means and said force receiving member; and



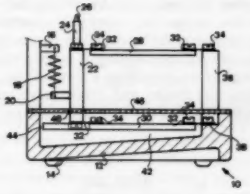
overload protection means coupled in series with said damping means in the path of force transmission between said load receiving means and said force receiving member.

4,440,251

SCALE WITH SIMPLIFIED GUIDANCE-DAMPER CONSTRUCTION

Peter Kunz, Gossau, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Apr. 29, 1982, Ser. No. 373,174
Claims priority, application Switzerland, Aug. 18, 1981, 5326/81
Int. Cl.³ G01G 23/08
U.S. Cl. 177—187 3 Claims



1. In force measuring apparatus comprising force receiving means, the improvement comprising

combined guidance and damping means connected to said force receiving means, said combined means having one member operative both to guide said force receiving means along a predetermined path upon application of force thereto and to dampen the motion of said force receiving means along said path;

a housing for said force receiving and combined means;

means for mounting said combined means in said housing in such a manner that said one member and a predetermined part of said housing together constitute an air damper;

wherein said combined means comprises guidance means of parallel construction having an upper member and a stiff lower plate constituting said one member, said predetermined part of said housing being the lower part thereof; and

wherein said stiff lower plate is mounted within said lower part of said housing in such manner that a predetermined small air gap is created between the edges of said stiff lower plate and the walls of said housing opposite thereto.

4,440,252

TRUCK CAB HYDRAULIC TILTING MECHANISM

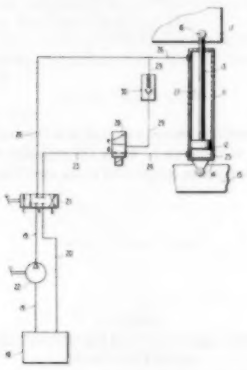
Rudolf Steinecke, Weinstadt, and Karl-Heinz Hensche, Leutenbach, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Nov. 17, 1981, Ser. No. 322,209

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043590

Int. Cl.³ B62D 27/00

U.S. Cl. 180—89.15 11 Claims



1. A hydraulic tilting mechanism for a cab of a vehicle, the mechanism including double-acting working cylinder means arranged between the cab and frame of a vehicle, piston means displaceably mounted in the cylinder means, means for connecting the working cylinder means with a source of hydraulic fluid so as to enable displacement of the piston means in the working cylinder means by the hydraulic fluid, means for preventing unauthorized operation of the tilting mechanism including by-pass line means for by-passing the working cylinder means, valve means for selectively controlling a flow of the hydraulic fluid into the by-pass line means, manually operable switch means for controlling a positioning of the valve means for selectively controlling a flow of the hydraulic fluid into the by-pass line means, and check valve means for allowing unidirectional flow of the hydraulic fluid in the by-pass line means.

4,440,253

CRAWLER-TYPE TRANSPORT APPARATUS

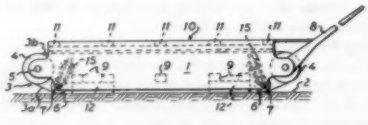
Bertil Pernum, Bernstorpsvägen 18, S-232 00 Arlöv, Sweden

Filed Feb. 22, 1982, Ser. No. 351,035

Claims priority, application Sweden, Jul. 6, 1981, 8104173

Int. Cl.³ B60V 3/04

U.S. Cl. 180—116 1 Claim



1. A transport apparatus comprising at least one crawler vehicle having a chassis, at least one movable endless track having a ground-engaging part, a plurality of wheels which are supported by the chassis and over which the track travels, said wheels comprising a track guide wheel at either end of the chassis, air cushion-producing means supported by the chassis and disposed between the chassis and the lower ground-engaging track part, and a source of compressed air for supplying air to the air cushion-producing means in order to provide between the chassis and the ground-engaging track part an air film supporting the chassis relative to the ground via the ground engaging engaging track part, wherein the chassis, in the area between the guide wheels adjacent either end of the chassis, supports moveable track hold-down and tensioning wheels which engage the upper side of the ground-engaging part of the endless track, said track hold-down and tensioning wheels being mounted movably along a substantially vertical axis relative to the chassis, said air cushion-producing means being disposed in the area between said track hold-down and tensioning wheels; a biasing device for biasing said track hold-down and tensioning wheels in a downward direction, said track hold-down and tensioning wheel biased by said biasing device to stretch and straighten the track along the portion thereof acted upon by the air cushion and thus act against the tendency of said air cushion to bend said track portion downwardly when it raises and supports the chassis in relation to the ground.

4,440,254

COMPLIANCE STEER CONTROL SYSTEM

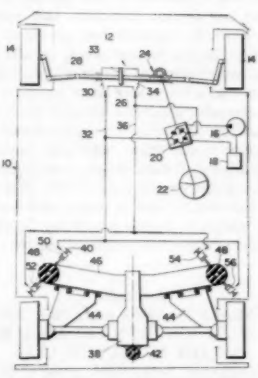
Yasuji Shibahata; Namio Irie; Kazuo Ikawa, and Yosuke Akatsu, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 9, 1981, Ser. No. 319,282

Claims priority, application Japan, Dec. 10, 1980, 55-176060[U]; Dec. 11, 1980, 55-173867

Int. Cl.³ B62D 5/06, 9/00

U.S. Cl. 180—140 14 Claims



1. In a vehicle having a pair of steerable front wheels mounted to said vehicle through a front suspension arrangement, a power steering system associated with said pair of front wheels through a linkage arrangement, which power steering includes a source of hydraulic pressure, a hydraulic servo having first and second chambers, a control valve responsive to the rotation of a steering wheel of the vehicle for selectively pressurizing said first and second chambers, and a pair of rear wheels mounted to said vehicle by a rear suspension arrangement which includes elastomeric mounting members;

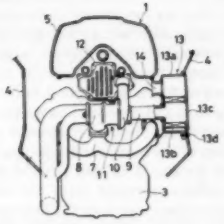
a compliance steer control system responsive to the pressurization of said first and second chambers for producing a bias which tends to turn one of said pair of front wheels and said pair of rear wheels with respect to said vehicle in the same direction as said front pair of wheels are turned in response to the rotation of said steering wheel.

4,440,255

AIR CLEANER APPARATUS FOR MOTORIZED TWO-WHEELED VEHICLE

Takashi Shinozaki, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 276,085
Claims priority, application Japan, Jun. 26, 1980, 55-85863
Int. Cl.³ B62K *11/08, 19/30*
U.S. Cl. 180—225 5 Claims



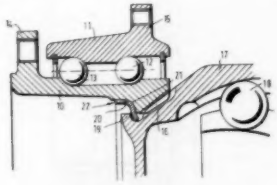
1. An air cleaner apparatus in a motorized two-wheeled vehicle including a vehicle body having front and rear wheels, an internal combustion engine at a middle portion between the wheels, and a fairing member in front of the engine extending forwards and rearwards, comprising an air cleaner located at an upstream end portion of an intake passage of the engine fixedly provided inside the fairing member, said air cleaner comprising a cleaner casing integrally formed in a side surface of said fairing member having an external air intake opening directed inwardly of said fairing member and a main opening facing outwardly of said fairing member, a removeable cleaner element in said casing, and a covering plate removeably covering and sealing said main opening.

4,440,256

BEARING AND UNIVERSAL JOINT ASSEMBLY

Bertram J. Palmer, Staffordshire, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Sep. 2, 1981, Ser. No. 298,899
Claims priority, application United Kingdom, Sep. 13, 1980, 8029666
Int. Cl.³ B60K *17/30*
U.S. Cl. 180—254 3 Claims



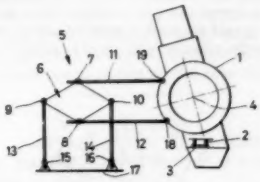
1. A wheel support assembly for a motor vehicle, comprising a bearing unit having an inner bearing member adapted to be secured to a vehicle wheel, an outer bearing member adapted to be secured to a suspension component of the vehicle, and a plurality of rolling elements disposed between said bearing members and rotatably mounting said inner bearing member relative to said outer bearing member; a universal joint member, interengaging formations on said universal joint member and inner bearing member for torque transmission therebetween, a retaining element comprising a separate annular component, permanently deformed to engage with formations in both said universal joint member and bearing inner member to hold said inner bearing member and universal joint member together, and at least one of said universal joint member and inner bearing member remaining undamaged by removal of said retaining element to dismantle the assembly.

4,440,257

VIBRATION-INSULATING BEARING ARRANGEMENT FOR A DRIVE UNIT

Hermann Danckert, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Continuation of Ser. No. 73,284, Sep. 7, 1979, abandoned. This application Jan. 28, 1982, Ser. No. 343,503
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843185
Int. Cl.³ B60K *5/00*
U.S. Cl. 180—300 9 Claims



1. A vibration-insulating bearing arrangement for mounting a drive unit, having a drive axis, on a supporting framework of a vehicle comprising:

a bearing means arranged between said drive unit and said framework for intercepting inertial forces of said drive unit; and

a torque brace including:

a torque transmitting element;

a first torque transmission means connecting said drive unit and said torque transmitting element for transmitting a rotational force to said torque transmitting element in response to a torsional movement of said drive unit about said axis, and for imparting a translational force to said torque transmitting element in response to inertial force caused by movement of said drive unit;

a second torque transmission means connecting said torque transmitting element and said framework for opposing said rotational force imparted to said torque transmitting element from said first transmission means, and for permitting the translational movement of said torque transmitting element in response to said inertial force;

said torque transmitting element transmitting said torsional forces to said framework, and yielding to movement of said drive unit so as substantially to prevent the transmission of said inertial force into said framework, characterized in that the transmission element is in a support means that is rigid between at least four force-introduction points, a first pair of said force-introduction points being articulated torque-transmitting connection with the drive unit by means of a first pair of elongated bar elements and, a second pair of said force-introduction points being articulately connected in a swiveling manner to the supporting framework, the second pair of said force-introduction points being movable essentially perpendicular to a connecting line between the first pair of force-introduction points.

4,440,258

TUNABLE STETHOSCOPE

Thomas J. Packard, Somerset, Wis., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed May 12, 1982, Ser. No. 377,395
Int. Cl.³ A61B *7/02;* H04R *25/00*
U.S. Cl. 181—137 11 Claims

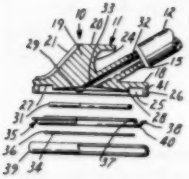
1. A stethoscope head comprising:

a body member having a first generally bell-shaped recess with an innermost central portion, an outer rim portion

and a bore extending through said body member communicating with said central portion of said first recess;

a diaphragm having a peripheral edge portion and a predetermined surface contour overlying at least a portion of said first recess and moveably connected to said outer rim portion of said recess;

a suspension member located between said outer rim portion of said first recess and the peripheral edge portion of said diaphragm for connecting said peripheral edge portion of said diaphragm to said outer rim portion of said recess to provide a first acoustical stiffness for said diaphragm, and for affording movement of said diaphragm in a direction generally perpendicular to the plane of said diaphragm between a normal outer position to which said diaphragm is biased by said suspension member and an inner position more closely adjacent said central portion of said first



recess without substantially changing the surface contour of or lateral tension in said diaphragm during said movement; and

immobilizing means situated on said body member and located within said first recess at about said central portion, said immobilizing means adapted to be contacted by at least one of said diaphragm and said suspension member and to substantially immobilize said diaphragm when said diaphragm is in said inner position so that said stethoscope head will pass low frequency sounds and attenuate high frequency sounds when said diaphragm is in said outer position and between said outer and inner positions, and when said diaphragm is in said inner position the acoustical stiffness of said diaphragm will be sufficiently higher than said first acoustical stiffness so that said head will pass high frequency sounds and attenuate low frequency sounds.

4,440,259

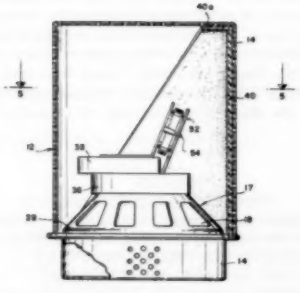
LOUDSPEAKER SYSTEM FOR PRODUCING COHERENT SOUND

John Strohbeen, 160 Bergen St., Brooklyn, N.Y. 11211

Filed Aug. 7, 1981, Ser. No. 290,956

Int. Cl.³ H04R *1/28*

U.S. Cl. 181—146 **18 Claims**



1. A loudspeaker for directing time and phase coherent sound wave fronts, substantially hemispherical in shape, into a listening area comprising:

a conical diaphragm having two coaxial ends defining an inner concave and an outer convex sound radiating surface therebetween and having the property that wave fronts propagate along the outer radiating surface at a speed greater than the speed of sound in the surrounding medium;

driving means coupled to a first end of said diaphragm for producing vibrating movement of the diaphragm;

first damping means disposed with respect to the diaphragm to absorb unwanted wave fronts, including the wave fronts produced at the inner concave radiating surface, such that wave fronts propagated into the surrounding medium are time and phase-coherent; and

second damping means disposed outwardly from and around a first portion of the outer surface to absorb the coherent wave fronts produced at said portion and propagating generally radially outward from the diaphragm in an undesired direction away from the listening area such that coherent wave fronts substantially hemispherical in shape propagate outwardly from a second portion of the outer surface into the listening area, said hemispherical wave fronts appearing in the listening area to be generated by a virtual source substantially on an axis positioned behind the axis of the diaphragm.

4,440,260

BASS-REFLEX LOUDSPEAKER SYSTEM

Preben Jacobsen, Glyngore, Denmark, assignor to Jamo Hi-Fi A/S, Glyngore, Denmark

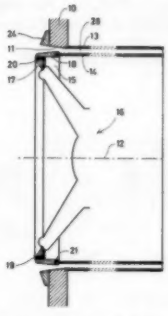
PCT No. PCT/DK82/00007, § 371 Date Sep. 28, 1982, § 102(e) Date Sep. 28, 1982, PCT Pub. No. WO82/02812, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 2, 1982, Ser. No. 432,936

Claims priority, application Denmark, Feb. 3, 1981, 475/81

Int. Cl.³ H05K *5/60*

U.S. Cl. 181—172 **2 Claims**



1. A bass-reflex loudspeaker system comprising an enclosure or cabinet having a front plate, which is provided with a substantially circular aperture or hole for the mounting of a bass loudspeaker or woofer and with a bass-reflex port in the shape of an annular slot around said speaker, said bass-reflex port being formed of the intermediate space between a first tubular member fixedly mounted to said front plate and a second tubular member mounted inside of and coaxially with said first member, wherein said bass loudspeaker or woofer (**16**) is fixedly mounted to said second tubular member (**14**) in that end which is directed towards the open, and wherein said second tubular member (**14**) at said end is mounted on the front plate (**10**) by means of vibration absorbing mechanical mounting means (**22**) for the provision of an essentially vibrationless front plate.

4,440,261

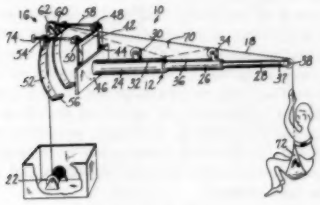
PORTABLE HIGH-RISE ESCAPE DEVICE

Mark J. Clark, 29 Brainerd Rd., Branford, Conn. 06405

Filed Nov. 21, 1980, Ser. No. 208,877

Int. Cl.³ A62B *1/02*

U.S. Cl. 182—3 **7 Claims**



1. A portable high-rise escape device comprising,

a telescoping length extendible boom,

actuable driver means for extending said boom comprising a cannister means connected to said boom to pneumatically extend said boom,

a detachable wall mounting bracket with said boom being connected to said bracket,

a length of cable having a harness at one end, actuator means responsive to a predetermined movement of said cable for actuating said cannister,

winch means to release said cable at a predetermined rate, said cable being partially contained on said winch means, and guide means to guide said cable from said winch means to the outer end of said boom, said guide means being mounted to said boom.

4,440,262

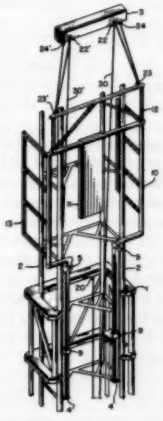
DELAYED DEPLOYMENT PLATFORM

Harlley L. Hunt, Midland, and Ansel T. Fletcher, Odessa, both of Tex., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 22, 1983, Ser. No. 468,041

Int. Cl.³ B66C *23/04, 23/62*

U.S. Cl. 182—114 **6 Claims**



1. An automatic delayed action platform deployment system for an extensible derrick comprising:

a platform attached to said derrick at an upper extensible section by means of at least one sliding hinge point disposed on said extensible section;

at least one slide guide for guiding said at least one hinge point and allowing relative movement of said at least one hinge point along said extensible section;

stop means disposed along said at least one slide guide for limiting said relative movement; and

means for suspending said platform in a vertical stored position; and

said means for suspending said platform further comprising means for lowering said platform relative to said extensible section to a point where said at least one hinge point coacts with said stop means to further prevent lowering of said platform relative to said extensible section and thereafter permit said platform to rotate about said at least one hinge point to a horizontal deployed position all in automatic response to raising of said extensible section.

4,440,263

ATTACHMENT TO A LADDER

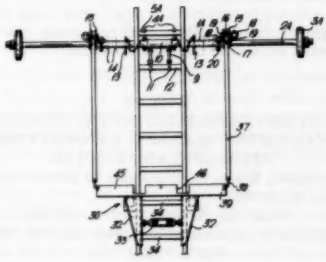
Samuel D. Smith, "Jamada", Newton of Pitcairns, Dunning, Perthshire, Scotland

Filed Jun. 26, 1981, Ser. No. 277,829

Claims priority, application United Kingdom, Jul. 30, 1980, 8024955; May 13, 1981, 8114650

Int. Cl.³ E06C *7/16, 7/48*

U.S. Cl. 182—121 **7 Claims**



1. A ladder attachment comprising an elongate cross-bar whose length is greater than the width of the ladder, attachment means mounted on the cross-bar for securing the cross-bar to at least two rungs of the ladder, a platform assembly which includes a framework having recesses for engagement with at least one other ladder rung extending below said two rungs and supporting a platform member, and support means connecting the platform assembly to the cross-bar.

4,440,264

LOCKING ASSEMBLY FOR A FOLDING SEAT

Silas J. Knoke, Seymour, and James F. Stamper, Nashville, both of Ind., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Continuation of Ser. No. 73,578, Sep. 7, 1979, abandoned. This application May 7, 1981, Ser. No. 261,416

The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.³ A47C *4/00, 3/18, 9/00*

U.S. Cl. 182—126 **4 Claims**

1. A locking assembly in combination with a foldable seat movable between a folded position and a supporting position, the seat including a support member extending between two of said legs and also including a step having a portion that is moved toward and away from the support member during movement of the seat between the folded and supporting positions, and said portion of the step being supported on the support member in the supporting position, the assembly comprising:

a support plate fixedly mounted to the lower side of the step

at said portion thereof, said support plate including a pair of spaced apertures and an integral flange downwardly depending from the support plate between the pair of apertures, and

a broad rigid hook having one end portion extending through said apertures and over said flange to pivotally connect the hook to the step, said hook having a second end portion for engaging the support member in a locked position of the hook to selectively secure the step to the

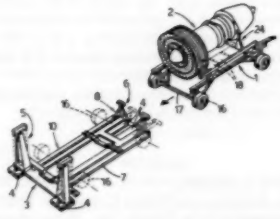
support member and thereby prevent movement of the step with respect to the legs, said hook having a stop on the one end portion thereof for engaging the support plate to position the second end portion thereof for engagement with the support member upon movement toward the support member, said end portions of the hook each having a ribbed construction, and said hook being movable to disengage the support member to thereby permit movement of the seat to the folded position.

4,440,265

HYDRO-PNEUMATIC POSITIONER FOR REMOVAL/OR INSTALLATION OF WING ENGINES OF AIRCRAFTS AND THE LIKE

Giulio Spagnoli, Rome, Italy, assignor to Alitalia Linee Aeree Italiane S.p.A., Italy

Filed Mar. 9, 1982, Ser. No. 356,522
Claims priority, application Italy, May 22, 1981, 48524 A/81
Int. Cl.³ B25J *5/00*
U.S. Cl. 182—129 **7 Claims**



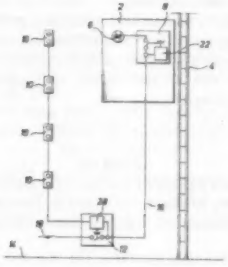
1. A hydro-pneumatic positioner for a wheeled trailer provided with a cradle for supporting or receiving a wing engine of an aircraft, to be used for the installation or removal of the engine of an aircraft, said positioner comprising: a basic structure underneath of which are fixed four air-cushion devices, and on which are mounted four hydraulic cylinders mounted on the corners thereof, said four cylinders including a front pair of cylinders and rear hydraulic cylinders, each being provided with a hoisting chain; and a frame suspended from said chains and adapted to receive and lift the trailer together with the cradle carrying the engine or without engine between a lowered and an elevated position, said lifting cylinders being designed to perform vertical operative strokes, the front pair of said cylinders being fixed to the basic structure, while the rear hydraulic cylinders are mounted on said structure so as to be able to be simultaneously brought and held in their vertical position, or be simultaneously tilted until they come into contact with the ground in substantial prosecution of the basic structure and vice versa, by a third pair of hydraulic cylinders; the central and rear portions of the positioner having a maximum width less than the inner facing surfaces of the wheels of the trailer, while the height of said central and rear portions of the positioner in the lowered position is less than the level of the distance between any lowermost part of the trailer placed between the wheels and the ground; said basic structure housing and/or supporting: a pneumatic circuitry and means for connecting said circuitry to an external source of compressed air, and for supplying said compressed air to the air cushion devices, as well as to an air driven motor driving a main oil rotary pump; an oil circuitry for supplying the oil to all the hydraulic cylinders, as well as to control, protection and adjusting means and to said main pump as well as to hand pumps for supplying the oil to the hydraulic cylinders and alternatively to the main pump.

4,440,266

RACK AND PINION LIFT SYSTEM

Ulf Köhler, Skellefteå, Sweden, assignor to Linden Alimak AB, Skellefteå, Sweden

Filed May 24, 1982, Ser. No. 381,408
Claims priority, application Sweden, May 26, 1981, 8103312
Int. Cl.³ B66B *1/06*
U.S. Cl. 187—29 R **8 Claims**



1. In a rack and pinion lift system, comprising a lift car, electro motor means for driving said car along a lift mast via rack and pinion means, a control unit in said car with a control buttons set including floor call buttons, call button units on landings along said mast, means connecting said call button units to said control unit via a ground level unit, the improvement comprising

(A) sensor means associated with said lift car having means for sensing passage of teeth of said rack and pinion means and producing corresponding position impulses representative of the position of said lift car along said mast

(B) a micro computer system comprising

(a) a programmable micro computer unit in said lift car with means for receiving said position impulses, register means for position impulse numbers based upon said position impulses and representative of the positions of landings, means for collecting and storing call impulses from said call button units and destination impulses from said control button set, and output and control means for controlling operation of the electric motor as determined by received call and destination impulses.

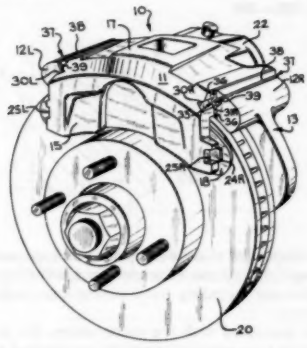
(b) a second micro computer unit associated with said ground level unit having means for scanning said call button units with respect to their state and sending corresponding call impulses to said programmable micro computer unit.

4,440,267

DISC BRAKE

Kamal El-Sheikh, Trenton, Mich., assignor to Kelsey Hayes Company, Romulus, Mich.

Filed Oct. 26, 1981, Ser. No. 314,637
Int. Cl.³ F16D 65/38
U.S. Cl. 188—73.35 2 Claims



1. In a disc brake having a disc rotatable about an axis, inboard and outboard friction assemblies engageable with inboard and outboard friction surfaces on said disc, caliper means for forcing said inboard and outboard friction assemblies into frictional engagement with the inboard and outboard friction surfaces respectively, thereby activating said brake, at least two fixed torque receiving arms extending axially over the periphery of said disc straddling said caliper therebetween, said caliper and each of said arms having generally parallel planar opposed abutment surface portions, axially extending grooves intermediate respective planar surface portions, the improvement comprising a generally elongated load bearing pin having a pair of oppositely protruding planar blade portions, said pin being positioned within opposed grooves to slidably support said caliper between said torque receiving arms with said planar blade portions being positioned between and in load receiving relationship with said caliper and arm planar portions.

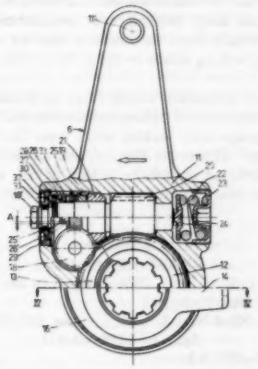
4,440,268

BRAKE LEVER FOR AN S-CAM AUTOMOTIVE DRUM BRAKE

Sven I. K. Karlsson, Lomma, Sweden, assignor to SAB Automotive AB, Landskrona, Sweden

PCT No. PCT/SE80/00307, § 371 Date Jul. 31, 1981, § 102(e) Date Jul. 31, 1981, PCT Pub. No. WO81/01732, PCT Pub. Date Jun. 25, 1981
PCT Filed Dec. 1, 1980, Ser. No. 287,747
Claims priority, application Sweden, Dec. 13, 1979, 7910263
Int. Cl.³ F16D 65/56
U.S. Cl. 188—79.5 K 4 Claims

1. A brake lever adapted for angular movement for attachment to a splined S-cam shaft of an automotive drum brake and connection to a brake cylinder push rod for automatic brake adjustment in the clearance sensing mode comprising in combination, a worm wheel rotatably mounted in a housing of the brake lever and having internal splines for cooperation with the S-cam shaft, and an axially movable worm screw shaft rotatable in the housing perpendicular to the worm wheel and having a worm screw meshing with the worm wheel, and a mechanism establishing a reference point relative to the worm wheel rotation, a control arm carrying a control disc with peripheral gear teeth mounted coaxially with the worm wheel for transmitting a control movement from the reference point by means of a unit coupled between the control arm and axially movable shaft including an intermediate control gear wheel rotatable about an axis substantially perpendicular to the movable shaft meshing with the control disc gear teeth and teeth about a control ring gear wheel, which is thereby rotatable on the worm screw shaft as a function of the angular movement of the brake lever, a force transmitting path between the control ring and the worm screw shaft responsive to slack to automatically adjust the brakes including a one-way clutch with a sleeve and a clutch ring and torque limiting clutch means biased into engagement by spring means engaging and axially biassing the worm screw shaft, means permitting limiting movement of the control ring gear wheel on the worm gear shaft thereby introducing a control gap (A) permitting circumferential play between the control ring and the clutch sleeve as the brake lever moves from normal position which thereby prevents brake adjustment until the play is overcome, and spring means biasing the control ring and the clutch sleeve towards a predetermined initial relative circumferential position wherein the control ring is moved as said function of the brake lever movement by means of said unit coupled between the axially movable worm screw shaft the control ring gear wheel with said play in engagement with said intermediate control gear wheel rotatable about an axis substantially perpendicular to the movable shaft meshing therewith and with the control disc teeth.

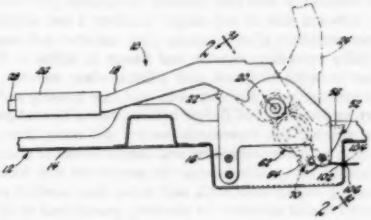


4,440,269

SELF ADJUSTING PARKING BRAKE

Paul J. Harriott, Ithaca, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 6, 1982, Ser. No. 395,144
Int. Cl.³ F16D 65/38, 51/04
U.S. Cl. 188—196 F 5 Claims



1. In a vehicle parking brake control mechanism for actuating a parking brake by force applied through a force transmitting member:

first means including a force storage and dispensing device,

said first means being operable to store and maintain a predetermined minimum force in said device and through said device establish and maintain the same predetermined minimum force on said force transmitting member, said predetermined minimum force value being less than the minimum force required to be applied through said force transmitting member to initiate braking action by the parking brake but being sufficient to keep the parking brake in an adjusted but inactive braking condition, incipient to the initiation of braking action, as the parking brake is worn;

and second means including said first means other than said device, said second means when actuated acting to deliver additional force beyond said predetermined minimum force to said force transmitting member to initiate and increase braking action by the parking brake to the desired extent;

said device dispensing stored force as needed to maintain said predetermined minimum force on said force transmitting member after parking brake wear has occurred so as to require adjustment thereof, and having the dispensed force replaced in storage in said device when said first means is next operated in the brake actuating direction.

4,440,270

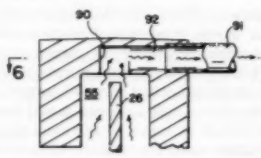
BRAKE APPARATUS

Roderick A. L. Ross, Troy, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,703

Int. Cl.³ F16D *65/853*

U.S. Cl. 188—264 AA **8 Claims**



1. In a brake assembly for use in a vehicle having vehicle wheels and a fixed axle housing; certain ones of said wheels having a rotatable support rotated by an axle; said axle located within said axle housing; said rotatable support includes an annular flange; an annular brake disc secured to said flange for rotation with said flange and said rotatable support; said annular flange having an axially extending annular seal flange secured thereto for rotation with said flange; a U-shaped caliper member overlying a portion of the periphery of said brake disc; said caliper member having an inboard side and an outboard side, a plate member interconnects said inboard side of said caliper member to said axle housing; an annular plate secured to the outboard side of said caliper member; a seal secured to the inner periphery of said annular plate member and contacts said axially extending annular seal flange to define a closed chamber between said seal, said annular plate member, said caliper member, said plate member, said axle housing and said support, said annular seal flange; braking means located on said caliper member for movement toward and away from said brake disc; actuating means on said caliper member operative for actuating said braking means for movement into frictional and braking engagement with said brake disc; conduit means connected to said chamber for directing pressurized air to said chamber to effect a flow of air therethrough to cool said brake disc; filtering means connected to said conduit means to filter the flow of air to said chamber; and an exhaust opening in said plate member on said inboard side of said caliper member for connecting said chamber with atmosphere for exhausting air from said chamber.

4,440,271

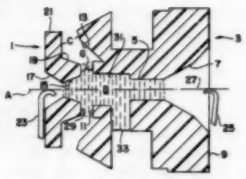
VISCOUS DAMPENING ARRANGEMENT FOR TAUT-BAND SUSPENSION

Willem J. L. Boreas, Sayerville, N.J., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Jun. 10, 1982, Ser. No. 387,102

Int. Cl.³ F16F *9/30*; **F16D** *57/00*

U.S. Cl. 188—268 **8 Claims**



1. An improved viscous dampening arrangement for a taut-band suspension system in an electrical indicating instrument, the instrument including stator means and rotor means and comprising:

a hub associated with the stator means, the hub having a central bore provided along its longitudinal axis;

a first tapered opening provided at least at one end of the central bore;

an annular lip formed at the other end of the central bore and surrounded by a second tapered opening;

a turret associated with the rotor means, the turret having a pair of tapered openings formed along its longitudinal axis and joined at their narrowest portions;

an exterior tapered portion surrounding one of the tapered openings formed in the turret;

the hub and turret being arranged to receive a taut-band of the taut-band suspension system along their longitudinal axes, the exterior tapered portion of the turret being arranged in a spaced-apart, facing relationship with respect to the annular lip and second tapered opening of the hub;

a viscous dampening fluid provided within the central bore of the hub and in contact with the annular lip thereof and the facing portion of the tapered opening provided in the turret; and

wherein the other tapered opening of the turret, the exterior tapered portion of the turret, and the first and second tapered openings of the hub are all provided with anti-wetting means.

4,440,272

APPARATUS FOR CONTROLLING THE BRAKING EFFECT OF A HYDRAULIC RETARDER

Gerold Bieber, Langenargen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 290,962

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1980, 3030494

Int. Cl.³ F16D *57/00, 65/78*; **B60K** *41/26*

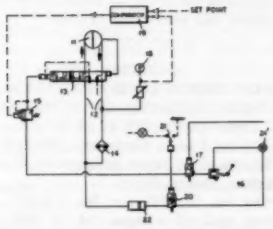
U.S. Cl. 188—290 **2 Claims**

1. In a hydraulic retarder system for a vehicle comprising a hydraulic retarder applying a braking force variable in response to hydraulic pressure in said retarder and connected in a hydraulic circulation path with a heat exchanger for dissipating heat from the hydraulic fluid of said retarder, and a control valve responsive to control pressure for varying said hydraulic pressure, said control pressure being a function of displacement of an operator-controlled element, the improvement which comprises the combination therewith of:

sensing means including a temperature sensor having an electrical output signal for detecting the temperature at said heat exchanger;

a regulator connected to said sensing means and including a

pressure-limiting valve connected between said element and said control valve for limiting said control pressure and for reducing the hydraulic pressure in said retarder independently of the operation of said element to a maximum level determined by the sensed temperature; and



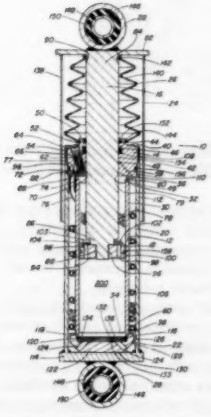
electronic circuit means for transforming said signal into an output controlling said regulator in dependance on the fading of a friction brake.

4,440,273

AERATION PREVENTING SHOCK ABSORBER

William S. Butler, Burleson, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 28, 1981, Ser. No. 335,120
Int. Cl.³ F16F 9/34
U.S. Cl. 188—315 **8 Claims**



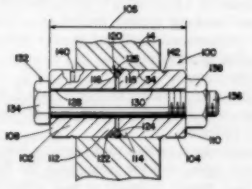
1. A shock absorber having fluid therein comprising:
cylinder means;
foot valve body means sealingly engaging one end of the cylinder means, the foot valve body means having apertures therethrough and foot valve plate means controlling the flow of said fluid through said foot body means;
outer case means having cover plate means on one end thereof, the cylinder means and foot valve body means disposed therein;
cylinder head means removably, sealingly engaging the other end of the cylinder means and outer case means, the cylinder head means having a central bore therethrough, annular seal means disposed within the central bore, relief check valve means disposed within a bore in the cylinder head means having an inlet and outlet thereto, and fixed orifice bore means having the inlet thereof communicating with the interior of the cylinder means and the outlet thereof communicating with the outlet of the relief check valve means, the relief valve means including:
annular valve spool means having first and second bores in the interior thereof;
relief valve ball means disposed within the annular valve spool means having a diameter larger than the diameter of the second bore of the annular valve spool means but smaller than the diameter of the first bore of the annular valve spool means;
spring support means disposed within the annular valve spool means, the spring support means comprising a cylindrical shaft having an enlarged head thereon adapted to engage the relief valve ball means;
valve spring means contained within the valve spool means having one end thereof abutting the enlarged head on the spring support means;
valve cap means having one end thereof adapted to abut the other end of the valve spring means; annular seal means located between the annular valve spool means and valve cap means; and
set screw means adapted to engage a portion of the bore within the cylinder head means and having one end thereof adapted to abut the valve cap means while the other end thereof contains a recess therein;
piston means having dust cover plate means secured to one end thereof and a reduced diameter portion on the other end thereof, the piston means slidingly, sealingly engaging the central bore of the cylinder head means;
piston head means secured to the other end of the piston means slidingly, sealingly engaging the cylinder means, the piston head means having a plurality of apertures therein and a piston head plate means slidably disposed on the reduced diameter portion of the piston means overlaying the plurality of apertures in the piston head means to control the flow of said fluid therethrough;
dust cover means having one end secured to the dust cover plate means of the piston means;
piston bellows means having one end secured to the cylinder head means and the other end secured to the end of the piston means having the dust cover plate means secured thereto; and
a plurality of attachment means secured to said shock absorber, one attachment means secured to the cover plate means of the outer case means and one attachment means secured to the dust cover plate means secured to the piston means.

4,440,274

DRUM BRAKE ANCHOR PIN ASSEMBLY

David R. Claydon, Brighton, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 218,318, Dec. 19, 1980, abandoned.
This application Oct. 12, 1982, Ser. No. 433,575
Int. Cl.³ F16D 51/20; F16B 2/14
U.S. Cl. 188—328 **8 Claims**



1. A selectively removable anchor pin assembly for a drum brake having a spider and a pair of generally arcuate brake shoes pivotably mounted on said anchor pin assembly, each of said brake shoes having a pair of generally parallel webs straddling said spider and defining generally concave pivot cavities, said spider having an anchor pin bore therethrough of gener-

ally annular generally uniform inner diameter in which said anchor pin assembly is selectively removably fixedly mountable, said anchor pin assembly comprising:

substantially identical first and second generally cylindrical anchor pin pieces, each of said pieces provided with an axially extending through bore generally concentric with the outer diameter surfaces thereof, said pieces having an outer diameter generally equal to the inner diameter of said anchor pin receiving bore, the combined axial length of said anchor pin pieces exceeding the axial length of said receiving bore, each of said pieces having an outer end for extending beyond said anchor pin receiving bore for providing a fixed cylindrical pivot surfce on each side of said bore and an inner end, each of said inner ends having an axially and radially inwardly extending ramp formed thereon,

an expansion member interposed said inner ends of said pieces, said expansion member having a radially and axially inwardly inclined surface formed on each axial end thereof for sliding engagement with said ramps, said expansion member being radially inwardly resiliently deformable to an outer diameter less than the inner diameter of said anchor pin receiving bore, compression of said expansion member between said pieces effective to radially expand said expansion member to an outer diameter greater than the inner diameter of said anchor pin receiving bore, and

means received through said axially extending bores in said pieces for applying and maintaining an axialy inwardly compressive force on said pieces.

4,440,275

CHECK VALVE FOR AUTOMOTIVE BRAKING SYSTEM

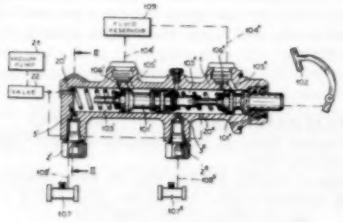
Herbert Sauer, Pfarrweisach, and Günter Gütlein, Ebern, both of Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Oct. 2, 1981, Ser. No. 308,111

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037569

Int. Cl.³ B60T *11/28*

U.S. Cl. 188—352 **10 Claims**



1. A check valve inserted between a master cylinder and a wheel cylinder in a hydraulic braking system in an automotive vehicle, said braking system including a brake pedal for enabling the pressurization of said master cylinder by an operator, said valve comprising:

a valve housing;

linkage means for connecting one end of said housing to said master cylinder and another end of said housing to said wheel cylinder;

flow-regulating means in said housing between said one end and said other end for permitting the flow of brake fluid from said master cylinder to said wheel cylinder during a braking stroke of said pedal and for partially blocking a return flow of fluid from said wheel cylinder to said master cylinder upon a release of said pedal; and

overriding means mounted in said housing and engageable with said flow-regulating means for deactuating same and opening said valve, thereby facilitating an evacuation of air from said system prior to charging same with brake fluid, said overriding means including a first member mounted in said housing for motion transverse thereto and a second member extending longitudinally in said housing from said flow-regulating means towards said first member, said first member being engageable with an end of said second member opposite said flow-regulating means to deactuate same and open communication between said master cylinder and said wheel cylinder.

4,440,276

TORQUE CONVERTER LOCK UP CLUTCH SHOCK ABSORBER WITH PRESSURE TRANSMITTING HOLE THROUGH DISK ELEMENT

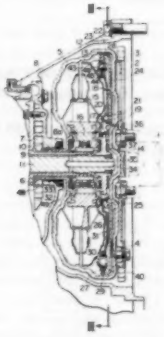
Seitoku Kubo, Toyota; Koujiro Kuramochi, Okazaki, and Tatsuo Kyushima, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 10, 1981, Ser. No. 282,187

Claims priority, application Japan, Jul. 28, 1980, 55-106647

Int. Cl.³ F16D *39/00*

U.S. Cl. 192—3.29 **3 Claims**



1. A rotary power transmission device for transmitting rotary power rotating around a central rotational axis, comprising:

(a) coaxial power input and power output shafts;

(b) a fluid torque converter comprising a pump impeller rotationally connected to said power input shaft, a turbine member rotationally connected to said power output shaft, and a stator member;

(c) a substantially disk shaped clutch assembly coaxial with said torque converter, said clutch assembly comprising a first clutch plate element rotationally coupled to said power input shaft and having a cylindrical outer flange portion firmly connected with a radially outside peripheral portion of said pump impeller, thereby defining an annular space adjacent a radially outer peripheral portion of said turbine member, and a second clutch plate element axially opposing said first clutch plate element;

(d) a rotary shock absorber mounted between said torque converter and said clutch assembly so as rotationally to couple said second clutch plate element and said power output shaft with a certain amount of resilient rotational play therebetween, comprising:

(d1) three axially superposed shock absorber plate elements, one of said three shock absorber plate elements being shaped as a substantially flat disk and the other two of said three shock absorber plate elements being shaped as substantially flat rings axially superposed with an outer peripheral portion of said disk shaped plate element, at least one of said ring shaped plate elements being rotationally coupled to said second clutch plate element, and the two outer ones of said shock absorber plate elements being rotationally coupled together, said

disk shaped plate element being formed with an opening therethrough at a radially intermediate portion thereof and located between said turbine member and said clutch assembly and directly rotationally connected at an inner peripheral portion thereof to said output shaft in parallel with and separately from said turbine member; and

(d2) a means for rotationally connecting together the combination of said two outer shock absorber plate elements and the middle shock absorber element with a certain amount of resiliently opposed rotational play being available therebetween; said two ring shaped plate elements, the outer peripheral portion of said disk shaped plate element, and said means for rotationally connecting together the combination of said two outer shock absorber plate elements and the middle shock absorber plate element being located in said annular space; and

(e) hydraulic pressure conducting means for selectively conducting hydraulic fluid pressure for hydraulically biasing said first and second clutch plate elements towards and away from one another, so as to engage to and disengage from one another.

4,440,277

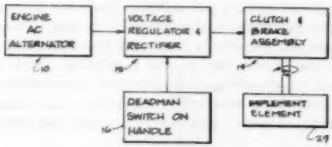
IMPLEMENT CLUTCH AND BRAKE CONTROL

Donald W. Thomson, Spokane, Wash., assignor to Claude W. Morris, Spokane, Wash., a part interest

Filed Oct. 13, 1981, Ser. No. 310,525

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—12 D **3 Claims**



1. An engine operated implement having a clutch and brake control, comprising:

an internal combustion engine having a rotatable output shaft;

a movable implement tool;

an alternator operatively powered by the engine output shaft;

a direct current-operated clutch and brake assembly operatively connected to both the engine output shaft and the movable implement tool for alternate operation as a clutch coupling the implement tool to the engine output shaft or as a brake releasing the implement tool from the engine output shaft and preventing movement of the implement tool, said clutch and brake assembly being normally biased to a first condition where it operates as a brake and being electrically shiftable by direct current to a second condition wherein it operates as a clutch;

controlled rectifier means operably connected between the alternator and the clutch and brake assembly for selectively converting alternating current produced by the alternator in response to engine operation to direct current for operation of the clutch and brake assembly; and electronic switching means operably connected between the alternator and said controlled rectifier means for enabling current flow through said controlled rectifier means when the voltage at the alternator is at or above a predetermined threshold voltage which results from engine operation at the normal engine speed required to power the implement tool.

4,440,278

CLUTCH AND BRAKE DEVICE FOR PRESSES, PUNCHES AND THE LIKE

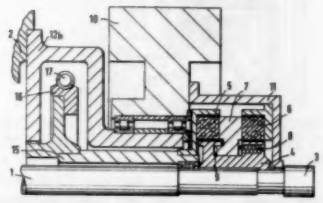
Heinz Weber, Wäschenbeuren, Fed. Rep. of Germany, assignor to L. Schuler GmbH, Fed. Rep. of Germany

Division of Ser. No. 247,739, Mar. 26, 1981, abandoned. This application Jun. 15, 1983, Ser. No. 503,085

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011589

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—18 R **4 Claims**



1. A clutch and brake for a press or punch having a flywheel means, and a drive shaft means having an end projecting beyond a support frame of the punch or press, the arrangement including

a friction clutch means for selectively connecting the drive shaft means to the flywheel means,

a friction brake means for selectively braking the drive shaft means,

a hollow support means extending through the flywheel means and surrounding the drive shaft means is provided for supporting the friction brake means,

an annular support means extends over the friction brake means and is attached to the flywheel means for enabling an engagement of the flywheel means with the drive shaft means by the friction clutch means,

a bearing means is provided for supporting the flywheel means on the hollow support means projecting beyond the support frame, the bearing means is arranged between the support frame and the friction clutch means and friction brake means, wherein

the hollow support means includes a hollow shaft having an end facing the support frame and an opposite end forming a support for the friction brake means,

a tubular extension is attached to the support frame and surrounds the hollow shaft for supporting the flywheel means,

a worm gear means is mounted on an end of the hollow shaft facing the support frame, and

a worm drive means adapted to be selectively driven and stopped is disposed in the tubular extension and is engageable with a worm gear means.

4,440,279

CONTROL SYSTEM OR METHOD FOR A FRICTION DEVICE SUCH AS A CLUTCH OR BRAKE

Friedrich Schreiner, Kehlen-Reute, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,564

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032558

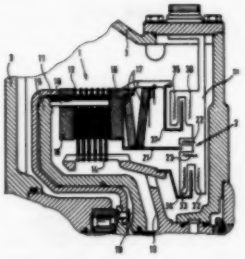
Int. Cl.³ F16D *13/75, 13/58*

U.S. Cl. 192—30 W **12 Claims**

6. A system for controlling a friction device, namely a clutch or brake having a pair of relatively rotatable members at least one of which is axially displaceable for frictional coupling of said members, said system comprising:

means for monitoring the degree of frictional coupling of said members;

signal-generating means responsive to said monitoring means for producing an electrical signal representing a reference point in the axial displacement of said one of said members upon maximum frictional coupling of said members for each actuation of said device;



means for electrically storing said signal representing said reference point for each actuation of said device; and

means for storing data representing a predetermined pattern of actuation of said device, and means for initiating said pattern of actuation of said device at a control point in the displacement of one of said members located at a predetermined distance ahead of the stored reference point of a predetermined actuation cycle.

4,440,280

SPRING CLUTCH MECHANISM

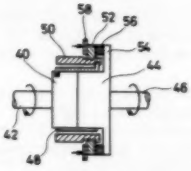
Hideaki Hagihara, Moriguchi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 28, 1981, Ser. No. 287,799

Claims priority, application Japan, Aug. 1, 1980, 55-110559

Int. Cl.³ F16D *23/00*

U.S. Cl. 192—36 **5 Claims**



1. A spring clutch mechanism comprising:

a first boss secured to a driving shaft;

a second boss secured to a driven shaft;

a coil spring disposed around said first and second bosses, one end of said coil spring being fixed to said first boss;

a first sleeve disposed around said coil spring, the other end of said coil spring being fixed to said first sleeve;

a second sleeve slidably mounted around said first sleeve, said second sleeve being slidable with respect to said first sleeve but not rotatable with respect to said first sleeve;

a flange secured to said second boss and being operatively positioned adjacent to said second sleeve; and

a depression plate disposed adjacent said second sleeve for depressing said second sleeve toward said flange secured to said second boss.

4,440,281

FLYWHEEL CLUTCH ASSEMBLY

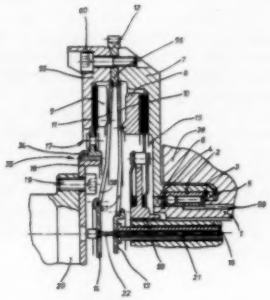
Hubert Hauguth, Steinberg, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,394

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023294

Int. Cl.³ F16D *21/08, 25/08, 13/44*

U.S. Cl. 192—48.8 **15 Claims**



1. In a flywheel clutch mechanism interposed between the internal combustion engine crankshaft and the transmission of a motor vehicle wherein said clutch mechanism includes a flywheel mass, a separating clutch interposed between said crankshaft and said flywheel mass and a starting and shifting clutch interposed between said flywheel mass and said transmission, the improvement comprising that in the assembly of said clutch mechanism said flywheel mass, said separating clutch and said starting and shifting clutch are all arranged to be initially mounted on the transmission side of said clutch mechanism and operatively supported at said transmission side, and that the clutch disc of said separating clutch and said crankshaft are joined together so as to be nonrotatable relative to each other by a rotatively interlocking connection during the assembly of said combustion engine and said transmission.

4,440,282

CLUTCH DRUM FOR AUTOMATIC AUTOMOTIVE TRANSMISSION

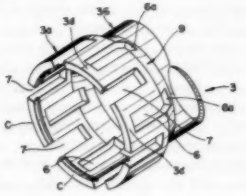
Wataru Ishimaru, Zushi, and Kazuyoshi Fujioka, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 28, 1981, Ser. No. 315,631

Claims priority, application Japan, Nov. 6, 1980, 55-156877

Int. Cl.³ F16D *13/68, 67/04;* **F16H** *57/10*

U.S. Cl. 192—70.2 **4 Claims**



1. In an automatic automotive transmission including a planetary gear train,

a clutch drum comprising:

a large diameter portion;

a small diameter portion;

an essentially frusto-conical section inteconnecting said large and small diameter portions;

means defining a plurality of first slots in said large diameter

portion which slots extend from one end thereof toward said small diameter portion and which terminate short of said frusto-conical portion, said first slots defining at one end of said drum a plurality of equidistantly spaced castle-like projections;

means defining a plurality of second slots in said drum which slots are each formed in a projection and which each lead from inboard of the end of a projection and terminate in said frusto-conical section.

4,440,283

FRICTION CLUTCH DRIVEN PLATE

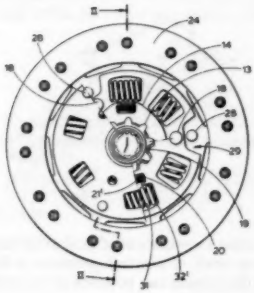
Raymond Nioloux, Saint Ouen, France, assignor to Automotive Products Limited, Warwickshire, England

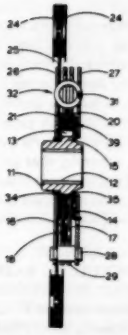
Filed Sep. 9, 1981, Ser. No. 300,648

Claims priority, application France, Sep. 10, 1980, 80 19499

Int. Cl.³ F16D 3/14, 3/66

U.S. Cl. 192—106.2 **4 Claims**





1. A friction clutch driven plate comprising:

a hub having splines on the outer surface thereof and a hub flange rotationally fast therewith;

a friction facing carrier co-axially mounted on the hub and capable of limited angular rotation relative thereto, said carrier comprising a facing carrier plate and a counter plate which are arranged one on each side of the hub flange;

an intermediate drive means co-axially mounted on the hub and capable of limited angular rotation relative to both the hub and the facing carrier, said drive means comprising two co-axial annular drive plates arranged one on each side of the hub flange, one of the drive plates being interposed between the facing carrier plate and the hub flange and the other of the drive plates being interposed between the counter plate and the hub flange, the drive plates being rotationally engaged with the hub by splines which loosely mesh with the splines on the hub to provide the limited rotation of said drive plates about the hub;

main torsion damper springs resisting rotation of the carrier relative to the intermediate drive means, each of said main spring being accommodated in aligned apertures in the drive plates, the facing carrier plate and the counter plate; and

auxiliary damping springs, softer than said main springs, resisting rotation of the drive means relative to the hub, each of said auxiliary springs being accommodated in aligned apertures in the hub flange and the two annular drive plates.

4,440,284

AUTOMATED ALUMINUM CAN REDEMPTION CENTER FOR DIRECT RETURN DEPOSIT PAYOUT

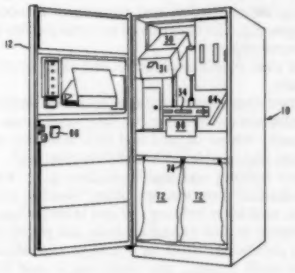
Bruce H. DeWoolfson, Arlington, Va., assignor to Environmental Products Corporation, McLean, Va.

Continuation-in-part of Ser. No. 148,371, May 9, 1980, Pat. No. 4,345,679. This application Mar. 5, 1982, Ser. No. 355,206

The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.³ G07F 7/00

U.S. Cl. 194—4 R **13 Claims**



1. Apparatus for collecting and storing empty aluminum containers having a distinguishing indicia thereon and for issuing predetermined return deposits for collected containers comprising:

preselection means for exposing a crushed or non-crushed container offered by a customer to an electromagnetic field for identifying whether said container is substantially aluminum without establishing direct electrical contact with said container, and for detecting the presence of said distinguishing indicia on said crushed or non-crushed container;

said preselection means including a container access area configured to accommodate both crushed or non-crushed containers for exposure to said field;

means for accepting only a container identified by said preselection means as being substantially aluminum and as having said distinguishing indicia thereon, independent of the configuration of said container;

dispensing means responsive to said preselection means for dispensing payment in return for containers having a substantially aluminum composition and carrying said distinguishing indicia;

means cooperating with said accepting means for crushing said containers; and

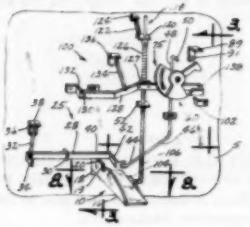
means for storing crushed containers received from said crushing means.

4,440,285

ADJUSTABLE PRICE SETTING MECHANISM FOR A VENDING MACHINE

Francis A. Wittern, Des Moines, and Arthur N. Wirstlin, Altoona, both of Iowa, assignors to Fawn Engineering Co., Des Moines, Iowa

Filed Jun. 24, 1982, Ser. No. 391,565
Int. Cl.³ G07F 5/08
U.S. Cl. 194—93 9 Claims



1. A mechanical control system for a vending machine having a frame and a vending member, comprising:

coin operated means having a shaft rotatable in response to monetary coins inserted therein, said shaft having a starting position and rotating in a first direction to a first position in response to the insertion of monetary coins of a low price denomination, and rotating to a second position in response to the insertion of monetary coins of a high price denomination;

a first cam rigidly secured to said shaft to rotate with said shaft;

a second cam freely rotatable upon said shaft and having a projection secured thereto, said second cam being gravitationally biased in said first direction and said projection being engageable with said first cam; and

a lever holding rod and lever having a "locked" and an "unlocked" position, and being biased to said locked position, said lever holding rod and lever locking said vending member in said locked position and permitting said vending member to vend an article in said unlocked position; said shaft rotating said first cam to said first position in response to the insertion of coinage of a low price denomination and said second cam rotating with said first cam to said first position, due to said gravitational bias in said first direction, said second cam holds said lever holding rod and lever in said unlocked position in said first position and permits said vending member to vend a low price article; said shaft rotating said first cam to a second position in response to the insertion of money coins of a high price denomination, said first cam holding said lever holding rod and lever into said unlocked position in said second position, and permitting said vending member to vend a high price article.

4,440,286

ORIENTATING DEVICE

John W. C. Saxon, Sawtry, England, assignor to Avdel Limited, Hertfordshire, England

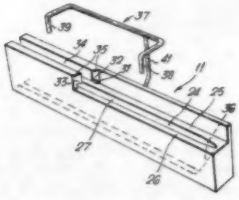
Filed Mar. 5, 1982, Ser. No. 355,216
Claims priority, application United Kingdom, Mar. 13, 1981, 8108004
Int. Cl.³ B65G 47/24
U.S. Cl. 198—380 3 Claims

1. An orientating device for orientating a component comprising an axially elongated body extending on both sides of a transversely extending abutment, the first part of the elongated body on one side of the abutment having a maximum transverse dimension greater than that of the second part of the elongated body on the other side of the abutment but not greater than that of the abutment and one of the body parts being longer in axial extent away from the abutment than is the other of the body parts; which orientating device comprises:

a slotted track along which the component is fed, the slot being so dimensioned as to pass the second part of the component body but not to pass the first part of the body nor the abutment, whereby the component can pivot about the position of engagement of the abutment with the track;

and air blast means arranged to urge the component to pivot as aforesaid so that the second part of the component body enters the slot, whereby the component can take up a desired orientation substantially transverse to the track with the second part of the component body entering into the slot;

wherein said air blast means comprises two air jets arranged so as to act successively on a component fed along the track at two positions spaced apart along the track,



whereby when a component of total axial length less than the distance apart of the two positions is fed along the track, the component can be acted on by only one of the air jets at any one time;

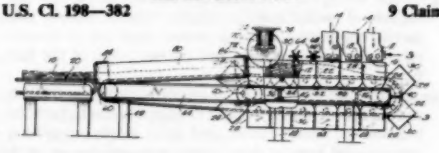
wherein said orientating device also includes abutment stop means situated on the track intermediate the positions of action of the two air jets, the abutment stop means being so arranged and positioned with respect to the positions of action of the two air jets that a component fed along the track and oriented along the track has its movement along the track arrested by the engagement of its abutment with the abutment stop in such a position that, regardless of whether the longer of its body parts is leading or trailing, only the longer of its body parts extends to a position of action of an air jet, whereby that air jet causes the component to pivot about its abutment towards the desired orientation transverse to the aforesaid track.

4,440,287

FLAKE ALIGNER INCLUDING BAFFLES SUPPORTED ON CONTINUOUSLY MOVING CONVEYOR

Anders E. Lund, Houghton; Gordon P. Krueger, Hancock, and Lynn B. Sandberg, Chassell, all of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Apr. 5, 1982, Ser. No. 365,623
Int. Cl.³ B65A 47/24
U.S. Cl. 198—382 9 Claims



1. Apparatus for forming a continuous elongated loosely felted mat of thin elongated wood flakes with the flakes being aligned in mutually parallel interleaved relation, the apparatus

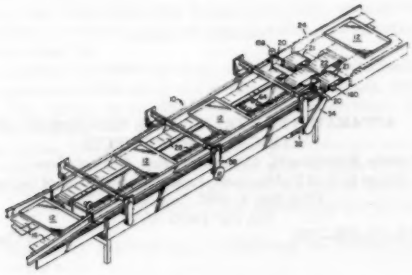
comprising means defining a mat supporting surface and including a plurality of conveyor belts positioned in adjacent side-by-side relation and means for supporting the conveyor belts for continuous movement as a conveyor, means for depositing wood flakes onto the supporting surface to form a loosely felted mat, means positioned between the means for depositing and the supporting surface for aligning the wood flakes in substantially mutually parallel relation and in substantially parallel relation to the direction of movement of the supporting surface and for maintaining the wood flakes in substantially parallel alignment as the flakes fall from the means for depositing onto the supporting surface, said means for aligning and maintaining alignment including a plurality of sets of thin planar baffle plates, each of said sets including a plurality of thin planar baffle plates supported in generally coplanar alignment and in mutually adjacent relation to form an elongated continuous baffle and each of said sets being positioned between pairs of said conveying members, said baffle plates of one set being separated from said baffle plates of an adjacent set by one of said conveyor belts and parallel to the baffle plates of an adjacent set of baffle plates, and means for supporting said baffle plates for movement with said supporting surface.

4,440,288

GROUP END SENSOR

William M. Thomas, Garland, and Richard D. Smith, Richardson, both of Tex., assignors to Stewart Engineering and Equipment Co., Plano, Tex.

Filed Dec. 4, 1981, Ser. No. 327,625
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—425 **25 Claims**



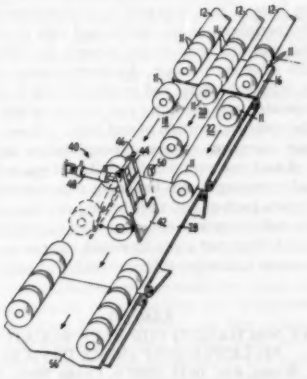
1. A grouping system for grouping objects comprising:
a frame;
a conveyor supported on said frame for moving the objects in a first direction;
first drive means for operating the conveyor to move the objects in the first direction at at least a first relatively fast speed and a second relatively slow speed;
a barrier mounted on said frame moveable between extended and retracted positions, the barrier in the extended position for contacting an object moving on the conveyor to stop the motion of the object in the first direction, the barrier stopping each following object as it contacts the preceding stopped object;
group end sensor means including forward and rearward sensors, each of said sensors for sensing the position of an object on said conveyor, said sensors detecting objects at positions separated by a predetermined distance, said group end sensor means adapted for movement along said frame;
second drive means for operating the group end sensor means in said first direction and in a second, opposite direction; and
control means for controlling said first and second drive means in response to said forward and rearward sensors, said control means operating said conveyor at the first relatively fast speed with the barrier extended and no object contacting the barrier and initially positioning said group sensor means so that the rearward sensor senses an object at the predetermined distance prior to contacting the barrier, said control means being responsive to the sensing of an object by the rearward sensor to operate the conveyor at the second relatively slow speed, said control means thereafter positioning the group sensor means rearward of the last stopped object with the forward sensor sensing said last stopped object and operating the conveyor at the first relatively fast speed until a following object is sensed by the rearward sensor.

4,440,289

DISCRETE ARTICLE TRANSPORT AND CONSOLIDATING SYSTEM

Rudolf R. Weis, Antioch, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Dec. 21, 1981, Ser. No. 332,419
Int. Cl.³ B65G *47/68*
U.S. Cl. 198—448 **3 Claims**

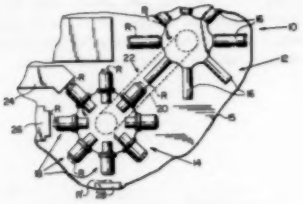


1. In combination:
a plurality of conveyors including an inner conveyor and outer conveyors disposed on opposite sides of said inner conveyor and parallel thereto for receiving discrete articles disposed generally side by side and transporting and consolidating said articles, said inner conveyor comprising a differential speed conveyor operating at a speed differing from the speed of said outer conveyors to move the articles on said inner differential speed conveyor out of side by side relationship with the articles on said outer conveyors; and
diverter means for engaging articles moved by the inner differential speed conveyor after they are moved out of said side by side relationship and displacing said articles into linear alignment with the articles moved by said outer conveyors, said diverter means comprising a reciprocal member for engaging articles moved by said inner differential speed conveyor and positively displacing said articles laterally and prime mover means connected to said reciprocal member for effecting back and forth movement thereof whereby articles engaged thereby are displaced to opposite sides of said inner differential speed conveyor onto said outer conveyors.

4,440,290
RECEPTACLE FORMING APPARATUS HAVING SPLIT RECEIVER

Warren E. Johnson, and Andrzej Maliszewski, both of Bristol, Conn., assignors to Sherwood Tool, Incorporated, Kensington, Conn.

Filed Apr. 2, 1981, Ser. No. 250,226
Int. Cl.³ B65G 47/86
U.S. Cl. 198—479 11 Claims

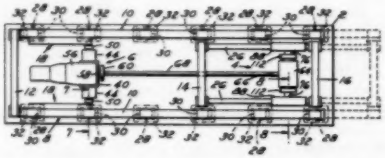


1. In an apparatus for forming a receptacle and comprising a rotatable turret, a receptacle receiver assembly having one part mounted in fixed position on the turret and another part supported for movement relative to the one part between receptacle holding and releasing positions, the one and the other part cooperating to define a radially outwardly opening receptacle receiving bore, a cam disposed at a predetermined location about the periphery of the turret, and cam engaging means associated with the receiver for moving the other part to its receptacle releasing position, the improvement wherein said one part defines the inner end portion of said bore, said other part cooperates with the outer end portion of said one part to define the outer end portion of said bore, and said cam engaging means comprises a yoke disposed below the outer end portion of said one part, a roller follower journalled on said yoke, and operating means including rods extending through said one part, each of said rods having one end connected to said yoke and its opposite end connected to said other part for moving said other part away from said one part in response to engagement of said roller follower with said cam.

4,440,291
DRIVE MECHANISM FOR RECIPROCATING AND MULTIPLE STEP INDEX DEVICES

John H. Brems, Apt. 16-D, 2800 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Feb. 10, 1982, Ser. No. 347,542
Int. Cl.³ B65G 25/00
U.S. Cl. 198—488 7 Claims



1. In a transfer system in which the motions required of a transfer member are generally, in sequence, a lift motion, a forward transfer motion, and a lowering motion, a modified cycloidal path generating mechanism for said transfer member utilizing higher harmonic component addition to achieve significantly longer substantially vertical movements at the ends of the cycle than an unmodified cycloidal path generating mechanism, comprising:

(a) a first transfer mechanism comprising:

(1) a frame,

(2) first shaft means journalled in said frame and rotating about a first axis,

(3) first crank means mounted on said first shaft means,

(4) gear means journalled on said first crank means for oscillation about a second axis displaced from said first axis,

(5) oscillating means operative between said frame and said gear means for oscillating said gear means about said second axis at a frequency which is an integral multiple of the frequency of rotation of said first crank means about said first axis,

(6) rack means mounted on said transfer member in pitch line contact with said gear means,

(7) floating frame means operative between said rack means and said gear means for maintaining pitch line contact therebetween, and

(b) a second transfer mechanism comprising:

(1) second shaft means journalled in said frame parallel to said first shaft means and rotating about a third axis,

(2) second crank means mounted on said second shaft means,

(3) connecting means mounted on said second crank means and rotatable about a fourth axis displaced from said third axis a distance equal to the distance between said first axis and said second axis,

(4) slide means mounted on said transfer member supported by said connecting means, and

(c) drive means interconnecting said first shaft means and said second shaft means to drive said first shaft means and said second shaft means in synchronism and at equal angular velocities.

4,440,292
APPARATUS FOR TRANSVERSE MOVEMENT OF ELONGATED WORKPIECES

Ludwig Regenbrecht, Gevelsberg, Fed. Rep. of Germany, assignor to Rolf Peddinghaus, Ennepetal, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,790
Int. Cl.³ B65G 25/00
U.S. Cl. 198—774 3 Claims

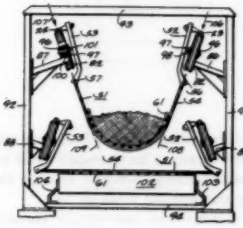
1. Apparatus for horizontal transport of elongate workpieces transverse to their longitudinal direction consisting of frame support means including horizontal guide beams defining longitudinal channels, lifting carriages supported by wheels movable in said channels, single means for moving said carriage relative to said beams in both horizontal and vertical directions whereby the carriage can be raised above the beam to lift the workpiece of the beam and lower the workpiece into the beam when desired, the means for raising each carriage consisting of longitudinally disposed interconnected angle levers and the means for moving the carriages in a longitudinal direction consists of a flexible pulling member disposed over a pulling system including a driving and driven pulley, said angle levers are interconnected by rigid means, said angle levers are pivotally connected to the carriages to adjustably support said carriages, said angle levers are supported by said wheels which move in said channels, means connecting one end of said pulling member to said angle levers and the other end of said pulling member to said carriage.

4,440,293

SLING BELT BULK MATERIAL CONVEYOR

Kenneth N. Allan, Menomonee Falls; Thomas J. Worringer, Wauwatosa, and Robert T. Baugh, Brookfield, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 217,587, Dec. 18, 1980, Pat. No. 4,378,875.
This application Sep. 30, 1982, Ser. No. 431,157
The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.
Int. Cl.[3] B65G *17/02*
U.S. Cl. 198—813 3 Claims



1. A conveyor including a pair of laterally spaced endless support cables each having a forwarding run and a return run between longitudinally spaced tail and head ends of said conveyor, said forwarding runs being substantially coextensive and situated at substantially the same elevation, said conveyor characterized by

a plurality of transverse slings arranged at longitudinally spaced intervals along said endless support cables, each sling having its opposite ends fastened, respectively, to said cables,

an endless flexible conveyor belt having working and return runs extending between said head and tail ends of said conveyor, said working run being supported without attachment on said slings in the forwarding run of said support cables,

a head pulley and a tail pulley supporting said endless conveyor belt,

means supporting said support cables including

a head sheave and a tail sheave supporting each of said support cables,

a plurality of cable support sheaves disposed at intervals along, and in supporting relation to, said forwarding run of said support cables, and

means rotatably supporting each of said support sheaves on an inclined plane for rotation about an axis substantially at a right angle to the line of force imposed on it by the cable it supports, said line of force lying substantially in said inclined plane,

a first tensioning winch connected to one of said sheaves supporting one of said support cables individually operable to tension the latter,

a second tensioning winch connected to one of said sheaves supporting the other of said support cables individually operable to tension the latter independently of said one support cable,

a belt tensioning means operatively associated with said conveyor belt operable to tension said belt independently of said support cables and

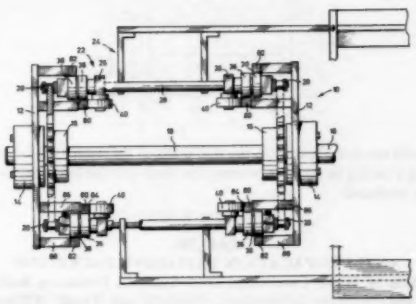
first and second individually controlled electric motors drivingly connected, respectively, to said first and second tensioning winches individually operable to selectively tension said support cables at relatively high tensions.

4,440,294

CONVEYOR

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Feb. 6, 1979, Ser. No. 9,846
Int. Cl.[3] B65G *15/60*
U.S. Cl. 198—838 2 Claims



1. A conveyor assembly comprising:

(a) a frame;

(b) an endless conveyor member extending in an endless path, said endless conveyor comprising;

(i) a pair of endless transmission roller chains supported by sprockets, at least one of which is driven, said chains being arranged in a spaced parallel relationship at opposite sides of said endless path,

(ii) a plurality of support shafts mounted on and extending laterally between said endless chains,

(iii) first and second rollers mounted on said support shaft at each side of said conveyor member, the first rollers being longitudinally aligned with respect to one another and the second rollers being longitudinally aligned with respect to one another, the first and second rollers being laterally spaced with respect to one another,

(c) first and second guide rail means mounted on said frame and extending parallel to the longitudinal extent of each side of said endless conveyor, said first guide rail being disposed inwardly of said endless path in alignment with said first rollers for supporting said first rollers against movement inwardly of said endless path, said second guide rails being disposed outwardly of said endless path in alignment with said second rollers and laterally spaced from said first rollers so as to support said second rollers against movement outwardly from said endless path and be out of engagement with said first rollers,

(d) sprocket means on said frame drivingly engaging said endless chains for movement along said endless path with said first rollers and said second rollers rolling along said first and second guide rails respectively while rotating in opposite directions thereby to provide a scuff free support for said endless conveyor.

4,440,295

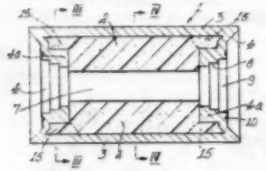
IDLER ROLLER

Thomas J. Blackwood-Murray, Sandton, and David Evans, Kempton Park, both of South Africa, assignors to Aerofoam Industries (Proprietary) Limited, Boksburg North, South Africa

Filed Oct. 31, 1980, Ser. No. 203,079
Claims priority, application South Africa, Nov. 1, 1979, 79/5863; Nov. 1, 1979, 79/5864
Int. Cl.[3] B65G *39/10*
U.S. Cl. 198—843 10 Claims

1. An idler roller, comprising: a prefabricated cylindrical core having a central bore therethrough for accommodating an idler shaft, and an outer cylindrical shell of non-foamed syn-

thetic plastic material separately moulded around the outer cylindrical surface and end faces of the core but not within said central bore to provide a tubular load bearing wall and end



walls integral therewith, the end walls of the shell each including a cavity in which a bearing for receiving the said shaft is to be mounted.

4,440,296

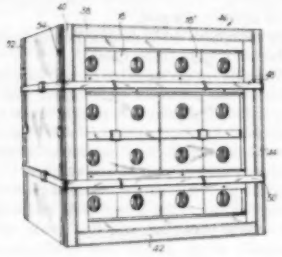
ANTI-PROPAGATION EXPLOSIVE PACKAGING

Philip M. Howe, Conowingo; Gould Gibbons, Finksburg, both of Md.; Clifford L. Aseltine, Houston, and Frank Williams, Rosharon, both of Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 6, 1982, Ser. No. 446,936

Int. Cl.³ F42B *37/00, 39/00*; B65D *85/30*

U.S. Cl. 206—3 **9 Claims**



1. A shielding apparatus for a plurality of munitions assembled together into a unit, comprising:

at least a first shield;

said first shield containing a material having an areal density high enough to render fragments from said plurality of munitions non-lethal to nearby munitions;

said material being incapable itself of forming lethal fragments; and

said shield being disposed at distances close enough to at least two adjacent ones of said plurality of munitions that fragments from detonation of one or more of said at least two adjacent ones impact said shield in a plate-like impact.

4,440,297

SELLING PACKAGE FOR SMALL PIECES ESPECIALLY FOR CHRISTMAS DECORATIONS

Harold Wohlfahrt, Herrngasse 2, 8803 Rothenburg ob der Tauber, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,759

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 8202317[U]

Int. Cl.³ B65D *25/54, 81/02*

U.S. Cl. 206—45.31 **8 Claims**

1. A box for displaying and selling Christmas decorations or the like products, wherein:

said box has a lower part including a side panel which forms a base for displaying said box in an upright position on one of its sides;

a second panel opposite said base panel;

said second panel having a support means receiving and supporting a substantially flexible hanging member of an article to be displayed and the attached article;

said box being dimensioned that said hanging tab is received in said support means so as to suspend said article above said base panel in freely swinging relation thereto when said box is in said upright position; and

a lid having a window-like opening for viewing an article within said box.

4,440,298

GREETING CARDS

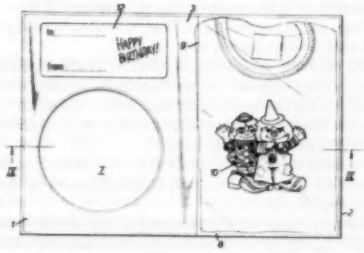
Peter E. Knight, Essex, England, assignor to Adrian Marsh Limited, Essex, England

Filed Jul. 19, 1982, Ser. No. 399,965

Claims priority, application United Kingdom, Jul. 22, 1981, 8122613

Int. Cl.³ B65H *71/00*

U.S. Cl. 206—216 **2 Claims**

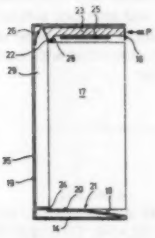


1. A greeting card comprising a front cover, a rear cover connected to the front cover by a hinge to enable the card to be opened and closed, a sheet of clear material attached to the inside surface of the cover and sealed thereto along the free edges of said rear cover, said sheet defining with the rear cover a pocket, a garment folded substantially flat and received in said pocket, and a window in the front cover, said garment being visible through said window when the card is closed.

4,440,299
CONTAINER FOR AT LEAST ONE CARRIER MEMBER BEARING A REELED TAPE-LIKE RECORDING MEDIUM, ESPECIALLY A MAGNETIC TAPE CASSETTE, AND AN ASSEMBLY OF TWO OR MORE SUCH CONTAINERS

Ludwig Peinecke, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,886
Claims priority, application Fed. Rep. of Germany, May 25, 1981, 8115534[U]
Int. Cl.³ A47B *81/06*; B65D *85/672*
U.S. Cl. 206—387 **5 Claims**



1. A container for accommodating at least one carrier member bearing a reeled tape-like recording medium, especially a magnetic tape cassette, which container consists of a hollow body of essentially right parallelepipedic shape, said hollow body comprising:

two large side walls which are parallel to one another, three narrow walls which interconnect said side walls, and an open side with an insertion/withdrawal opening for the carrier member with the reeled tape;

a support surface which is substantially parallel to the bottom narrow wall and is considerably shorter than the length of the bottom wall of the carrier member,

a ramp declining along an edge from said support surface to said insertion/withdrawal opening;

a holding means on the hollow body, said holding means, while said carrier member is resting with its bottom wall on said support surface, normally engaging said carrier member at its top so as to keep said member from tilting forwardly along said edge; and

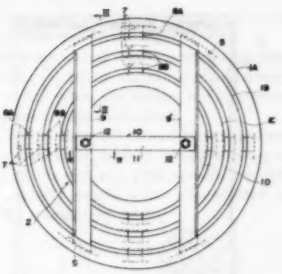
means for releasing said holding means from said carrier member so as to permit said member to tilt forwardly, under the effect of gravity, about said edge into a withdrawal position on said inclined ramp, in which position the carrier member protrudes from the insertion/withdrawal opening.

4,440,300
MOLDING DEVICE FOR NESTED PIPES

Tatsuo Kanazawa, Kamagaya, and Tsuneo Suyama, Narita, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 14, 1982, Ser. No. 368,133
Claims priority, application Japan, Jul. 31, 1981, 56-121254
Int. Cl.³ B65D *85/20, 85/62*; F16L *7/00*
U.S. Cl. 206—446 **10 Claims**

10. A nested pipe assembly comprising nested pipes of different diameters; spigot spacer means interposed between the spigots of each two adjacent pipes; socket spacer means interposed between the socket of each two adjacent pipes restraining the diametrically smaller one of the two pipes from moving axially thereof in the direction of insertion thereof into the other diametrically larger pipe; and a holding device attached to the socket ends of the nested pipes; the holding device including a frame structure adapted to be assembled and disassembled and comprising at least two beam members, each beam member having ends spaced apart a distance less than the internal diameter of the socket end of the diametrically largest pipe and having an intermediate portion abuttingly contacting the socket end face of each diametrically smaller pipe, one of said beam members being provided at both of its ends with engaging portions fitting into an annular groove formed in the inner periphery of the socket of the diametrically largest pipe,

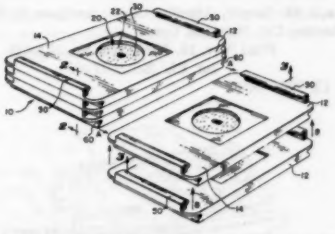


at least one end of the other of said beam members being provided with an engaging portion fitting into said annular groove of the diametrically largest pipe socket, and connecting means detachably connecting said beam members together whereby said beam members and connecting means are assembled to form said frame structure.

4,440,301
SELF-STACKING REAGENT SLIDE

Franklin S. Intengan, Hialeah, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 16, 1981, Ser. No. 283,841
Int. Cl.³ B65D *85/48*
U.S. Cl. 206—456 **17 Claims**



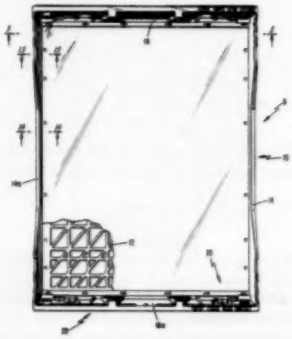
1. A self stacking reagent slide comprising a substantially planar body, having a reaction area, said reaction area being defined by an opening through said planar body and adapted for engagement of a sheet-like porous medium, said planar body being further provided with interlocking means said interlocking means comprising ribs and mating grooves arranged along an axis parallel to the plane of said planar body so as to permit the sliding engagement and disengagement of the top face of said slide with the bottom face of a slide of like construction and the sliding engagement and disengagement of the bottom face of said slide with the top face of a slide of like construction.

4,440,302

NESTABLE AND STACKABLE BASKET ASSEMBLY

Charles R. Ehrman, Memphis, Tenn.; Ronald W. Killgo, Athens, Tex., and Paul P. Piper, Jr., Memphis, Tenn., assignors to Piper Industries, Inc., Memphis, Tenn.

Filed Nov. 18, 1981, Ser. No. 322,655
Int. Cl.³ B65D 21/06
U.S. Cl. 206—506 21 Claims



1. A nestable and stackable basket assembly enabling a plurality of like basket assemblies to nest within each other at adjustable heights in stacked relationship, comprising:

(a) a bottom wall, end walls and side walls forming an upwardly open basket body;

(b) stacking tower means including stepped slot means located in each end wall and projecting from said end walls to provide nesting stop surfaces located at different and corresponding heights;

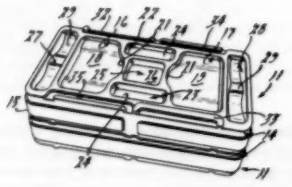
(c) lug means supported on and projecting from the upper portion of each of the end walls, each of said lug means having an upwardly projecting support surface, said lug means being laterally and slidably movable along the end walls such that the support surfaces of the lug means can be vertically aligned for supporting engagement with the corresponding stop surfaces of like basket assemblies, whereby multiple nested and stacked positions of said basket assemblies may be obtained.

4,440,303

TRAY

Richard H. Seager, Mystic, Conn., assignor to King-Seeley Thermos Co., Norwich, Conn.

Filed Nov. 16, 1981, Ser. No. 321,418
Int. Cl.³ B65D 21/02
U.S. Cl. 206—509 1 Claim



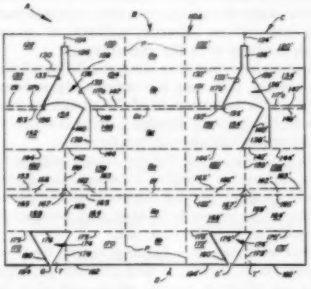
1. An insulated tray having spaced upper and lower surfaces, said upper and lower surfaces being formed with a plurality of different shaped depression means therein for receipt of food articles or the like, said depressions including a pair of elongated depressions each extending along one side of said upper surface substantially between opposite marginal edges, said elongated depressions each having the same configuration, said depressions on said upper surface and said lower surface being configured to present the same appearance regardless of which surface faces upwardly and regardless of which said of the exposed surfaces lies to the right of the viewer, interlocking means formed on said upper surface, and interlocking means formed on said lower surface, said interlocking means comprising only a relatively shallow recess and a complimentary relatively low projection formed adjacent each other on each of the marginal edges of each of said tray surfaces, said recesses and said projections lying on opposite quadrants of the respective tray surfaces, said recesses and said projections having a U-shape in plan, said upper and lower surface interlocking means being configured so that pairs of said trays may be stacked one upon the other and interlocked against relative transverse movement, said interlock means being further configured so that the pairs of trays may be stacked with either tray inverted relative to the other with both trays upright, or with both trays inverted.

4,440,304

PROTECTIVE PADS WITH SELF-LOCKING PANELS AND BLANK THEREFOR

Matthew S. Konopko, Chicago, Ill., assignor to Stone Container Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 262,193, May 11, 1981, Pat. No. 4,372,446. This application Mar. 15, 1982, Ser. No. 358,334
Int. Cl.³ B65D 81/10
U.S. Cl. 206—586 25 Claims



1. A pad for protection of a crated object formed from a single blank of foldable sheet material, said pad comprising:

A. a pair of multiple-ply wall formations intersecting to form two walls of a corner configuration;

B. a multiple-ply base formation connected to both of said walls at substantially right angle in said corner configuration;

C. said base formation being of generally L-shaped configuration having conjoined first multiple-ply leg and second multiple-ply leg formations; and

D. at least one said ply in at least one of said leg formations including a mitered base panel having a tip formation formed by the intersection of at least one mitered edge with at least one other edge of said panel, said tip formation being slidably and releasably compressed in the direction of coplanar engagement thereof with a second base panel forming one of said plies in said other leg formation, to releasably lock engagement of said panels within said corner configuration while allowing release of said locked engagement by slidable, coplanar withdrawal of said tip formation from said engagement.

4,440,305

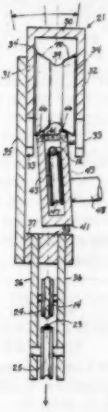
CARRIAGE FOR CABLE LOGGING SYSTEM

Cleveland J. Biller, Morgantown, and David D. Johnson, Booth, both of W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 210,460, Nov. 25, 1980, abandoned. This application Nov. 12, 1982, Ser. No. 441,198

Int. Cl.³ B66C 21/00

U.S. Cl. 212—90 11 Claims



1. A logging system comprising yarder means, tailspar means, skyline cable means interconnecting the yarder means and the tailspar means, intermediate support means located between the yarder means and the tailspar means, said intermediate support means comprising an upwardly facing channel shaped member having upstanding side walls provided with support pulley means journalled between said side walls, said side walls extending uniformly from end to end of said channel shaped member, means supporting said channel shaped member substantially parallel with said skyline cable means with the cable means supportingly engaged on said pulley means and received in said channel shaped member, load carriage means provided with carriage pulley means normally supportingly engaged on said skyline cable means and being engageable on the top edges of said side walls, means to elevate the load carriage means and disengage the carriage pulley means from the skyline cable means responsive to the movement of the carriage means over the channel shaped member, wherein the top edges of the side walls of said channel shaped member are upwardly and inwardly bevelled, wherein the carriage pulley means has tread means shaped to substantially conform with the upwardly and inwardly bevelled track surfaces defined by said side wall top edges, wherein said tread means comprises substantially frusto-conical, inwardly tapering pulley peripheral surfaces on the carriage pulley means spaced to engage on the bevelled top edges of said channel shaped member, and wherein said frusto-conical peripheral surfaces are substantially wider than the bevelled track surfaces of said side wall top edges to allow variable angling of the load carriage means relative to said channel shaped member.

4,440,306

TAMPER-EVIDENT CLOSURE

E. James Van Buskirk, Norwich, and James Ennis, Preston, both of Conn., assignors to Silver Industries, Norwich, Conn.

Filed Jan. 12, 1983, Ser. No. 457,370

Int. Cl.³ B65D 55/02

U.S. Cl. 215—230 12 Claims

1. A tamper evident closure for a container having a threaded neck comprising:

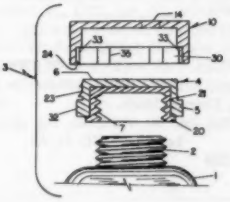
(a) a cap having a side portion and a top portion, and cap threads associated with the side portion for engaging the neck threads such that the cap may be threaded onto the neck in a clockwise direction to close the container and threaded from the neck in a counter-clockwise direction to open the container;

(b) an enclosing means for enclosing the side portion and the top portion of the cap and being rotatable about the cap in the counter-clockwise direction;

(c) visible warning indicia disposed on at least one of the side portion and the top portion of the cap;

(d) transparent means associated with the enclosing means wherein the warning indicia on the cap is visible through the transparent means when the indicia and transparent means are in alignment with each other;

(e) pre-positioning means disposed on said enclosing means and said cap for releasably initially pre-positioning the enclosing means on the cap at a predetermined position where the said warning indicia is not aligned with nor visible through the transparent means;



(f) clockwise anti-rotation means disposed on said enclosing means and said cap for preventing clockwise rotation of the enclosing means about the cap so that the enclosing means and cap may be clockwise rotated to thread the cap into the neck and close a filled container without disturbing the pre-positioning of the enclosed means on the cap;

(g) counter-clockwise rotation limit and locking means disposed on said enclosing means and said cap for limiting the counter-clockwise rotation of the enclosing means about the cap to a predetermined position where said warning indicia and transparent means are aligned with each other, and for permanently locking the enclosing means and cap together in that predetermined position;

whereby rotation of the enclosing means about the cap in the counter-clockwise direction to first open the container results in the warning indicia being permanently visible through the transparent means.

4,440,307

CONTAINER ASSEMBLY

Herbert D. Bartels, Palos Heights, and Leonard A. Maliszewski, Western Springs, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

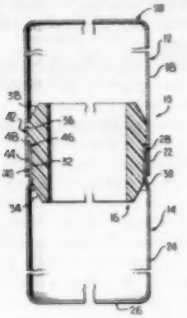
Filed Jun. 30, 1978, Ser. No. 921,035

Int. Cl.³ B65D 7/00

U.S. Cl. 220—4 B 9 Claims

1. A container assembly comprising a pair of cup-shaped container halves and a coupling sleeve, said container halves including first and second container halves having free ends of different diameters and including an outer free end portion and an inner free end portion each terminating in a free end, said inner and outer free end portions being in telescoped relation

with one another and with said coupling sleeve, said free end portions being disposed entirely to one side of said coupling



sleeve in a radial direction, said coupling sleeve being disposed radially inwardly of said free end portions.

4,440,308

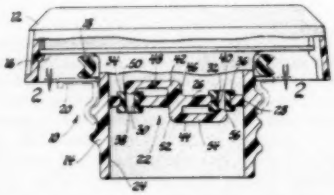
FUEL CAP VALVE STRUCTURE

Steven F. Baker, Bellevue, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 20, 1982, Ser. No. 451,277

Int. Cl.³ B65D *51/16*

U.S. Cl. 220—204 **3 Claims**



1. A valve structure for use in a threaded closure of a fuel cap for providing a superatmospheric pressure relief and a subatmospheric pressure relief, said valve structure comprising; a flat plate member having spaced flat surfaces and a cylindrical outer surface adapted to be secured to the inner surface of the threaded closure; two apertures extending between the flat surfaces on said flat plate member; two grommet members formed of resilient material each disposed in respective ones of said apertures and each grommet having a central opening and spaced ridge surfaces contacting the flat surfaces of the flat plate member; and a pair of stem members with each stem having a body portion integral with and extending normal to respective ones of the flat surfaces and a flexible arm portion extending from said body portion parallel to the respective flat surface and terminating in a valve member which engages and sealingly closes a respective grommet member.

4,440,309

HERMETICAL STOPPER FOR LIQUID RECEPTACLE

Tsuyoshi Morimoto, Osaka, Japan, assignor to Totoku Co., Ltd., Osaka, Japan

Filed Oct. 18, 1982, Ser. No. 434,897

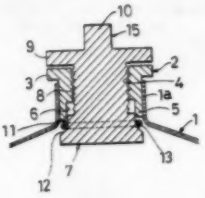
Claims priority, application Japan, Oct. 22, 1981, 56-157778[U]

Int. Cl.³ B65D *53/00*

U.S. Cl. 220—235 **3 Claims**

1. A hermetical stopper used for a liquid receptacle, which comprises;

providing a holding member down the bottom of the main body of said stopper which is to be inserted into the discharge port of said receptacle, said holding member projecting below said main body and being made to shift in the direction of entering and leaving said main body by the action of an operating means being located on the upperside of said main body;



mounting an O ring externally on the outer circumference of the projecting part of said holding member; and

making said O ring swell outward by the shifting movement of said holding member to the side of said main body, whereby said O ring is made to closely adhere to the inner wall of said liquid receptacle.

4,440,310

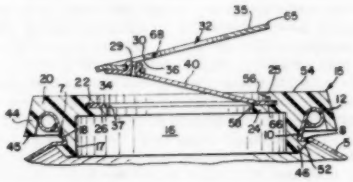
CLOSURE FOR DOMED BEVERAGE CONTAINERS AND THE LIKE

William M. Heyn, New Canaan, Conn., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Feb. 2, 1983, Ser. No. 463,230

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—270 **16 Claims**



1. In combination, a container having an end portion defining an open end, a plastic fitment, said end portion and said fitment having cooperating means providing sealing attachment of said fitment to said container, said fitment having an opening, a closing disk, means connecting said disk to said fitment whereby said disk closes off the opening, said disk having a weakening line defining an opening panel in said disk, and manually operable tab means cooperating with said disk to break said disk along said weakening line for removal of said opening panel and providing access to contents of said container.

4,440,311

SEALED MOISTUREPROOF CONTAINER

Louis S. Hoffman, Morristown, and Susan L. Kuriander, Hoboken, both of N.J., assignors to H. P. Hood Inc., Boston, Mass.

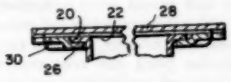
Division of Ser. No. 181,154, Aug. 25, 1980. This application Jun. 28, 1982, Ser. No. 392,649

Int. Cl.³ B65D *41/16, 41/18*

U.S. Cl. 220—306 **6 Claims**

1. A container having an open end, an outwardly-extending end flange extending continuously peripherally of the open end disposed in the plane of the open end and a removable lid applied to the open end comprising a surrounding structure positioned peripherally of the end flange having outwardly and inwardly-extending flanges, the outwardly-extending

flange of the surrounding structure lying in the plane of the end flange and the inwardly-extending flange lying below the end flange in parallel relation to the end flange and a film sheet adhesively secured to the end flange and to the outwardly-extending flange of the surrounding structure with adhesive such that the bond between the end flange and the outwardly-



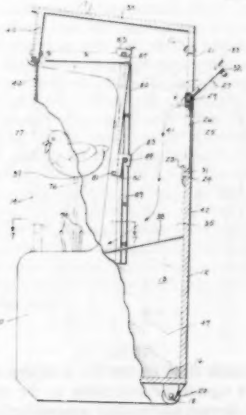
extending flange is greater than the bond between the film and the end flange so that by grasping the lid and pulling upwardly thereon to disengage the inwardly-extending flange from beneath the end flange, the bond between the film and the end flange can be broken and the film peeled away from the end flange.

4,440,312

VENDING MACHINE WITH FRONT DISPLAY AREA

Robert L. Glaser, Deerfield, Ill., assignor to L. M. Becker & Co., Inc., Appleton, Wis.

Filed Nov. 25, 1981, Ser. No. 324,798
Int. Cl.³ G07F *11/44*
U.S. Cl. 221—24 **4 Claims**



1. In a vending machine having a merchandise chamber for a flowable body of merchandise items, said flowable body being of a selected normal depth, wherein the chamber comprises a bottom wall, a top wall, a vertical front wall that is at least partially transparent, vertical side walls, a back wall, mechanized dispensing means near the bottom of the chamber for dispensing items of merchandise to the exterior of the chamber, and a display member behind the front wall and disposed above the normal merchandise depth, improvement wherein:

the portion of the chamber below the selected normal depth is a lower storage area, and the portion of the chamber above the selected normal depth is an upper chamber;

there is a vertical hopper partition extending between the side walls behind the display member to divide the upper chamber into a front display area and a rear hopper, both of which extend above the normal merchandise depth, the portion of the lower storage area in front of the partition being a lower frontal storage chamber, the lower frontal storage chamber being suitable for storing a plurality of said merchandise items at a selected normal depth below said display member and being at least partially unseparated from said front display area, the bottom of the partition being spaced above the bottom wall a distance corresponding to the normal merchandise depth to limit to that depth the body of merchandise that can flow from the rear hopper into the lower frontal storage chamber and so as to allow for a refilling of the lower frontal storage chamber from merchandise items stored in the rear hopper; and

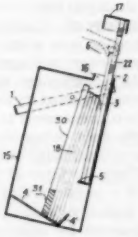
there is a loading aperture near the top of the hopper that allows merchandise to be introduced from the exterior of the machine into the hopper.

4,440,313

VENDING MACHINE FOR FLAT ARTICLES

Manfred Krassnig, Karl-Friedrich-Gauszstrasse 33 (Kärnten), A-9020 Klagenfurt, Austria

Filed Oct. 27, 1981, Ser. No. 315,676
Claims priority, application Austria, Oct. 30, 1980, 5359/80; Aug. 17, 1981, 3593/81; Fed. Rep. of Germany, Sep. 14, 1981, 3136334; Sep. 14, 1981, 8126732[U]
Int. Cl.³ B65H *3/22*; G07F *11/16*
U.S. Cl. 221—213 **9 Claims**



1. In a vending machine for flat articles, such as newspapers and the like, having a housing in which a delivery slot for the articles is provided, a delivery device actuatable by a handle disposed outside the housing, the delivery device having sharp projections directed in a delivery direction and facing an article to be delivered, a support plate on which the articles stand being inclined downwardly toward the delivery device and at its lower edge having an upwardly extending bend, the improvement wherein the delivery device comprises

an ejection plate means carrying said sharp projections approximately at a center thereof and upon operation of the handle for being moved into a delivery position in which said ejection plate means extends in part out of the delivery slot,

at least one supporting projection at an edge of said ejection plate means opposite the delivery slot, said at least one supporting projection is directed towards the support plate,

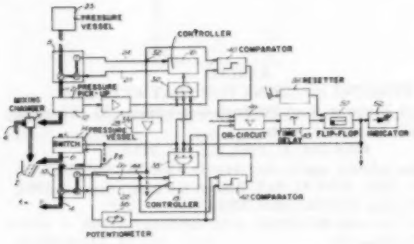
said ejection plate means being arranged inclined rearwardly, the support plate forming an acute angle with said ejection plate means, and wherein

said lower edge of said support plate is disposed away from a path of travel of said ejection plate for holding said articles away from said sharp projections prior to operation of said handle, the positioning of said support plate providing for engagement of one end of an article while an opposite end nearer said delivery slot is permitted to rest upon said ejection plate thereby providing for engagement of said sharp projections only after movement of said delivery plate.

4,440,314
METHOD AND APPARATUS FOR THE AUTOMATIC DYNAMIC DOSING AT LEAST OF ONE FLUID COMPONENT OF A MIXED FLUID

Kurt Vetter, Rechbergweg 24, Remseck 3, Fed. Rep. of Germany 7148 , and Werner Schweiker, Fasanenweg 8, Gemmrigheim, Fed. Rep. of Germany 7121

Continuation of Ser. No. 972,373, Dec. 22, 1978, abandoned.
This application Jul. 13, 1981, Ser. No. 282,564
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758096
Int. Cl.³ B67D 5/32, 5/52; G01F 5/00; G05D 11/00
U.S. Cl. 222—39 13 Claims



1. In an apparatus for performance of a method for the automatic dynamic dosing at least of one liqiud component of a mixed liquid, particularly of a hardener of a 2 component-lacquer with mother lacquer, with which the flow of a pressure-transported main component is measured and the flow of a pressure-fed secondary component which is to be dosed is regulated and moreover adjusted corresponding to a predetermined ratio of the two components to be mixed, wherein the measured flow of the main component is used as a variable desired value of the nominal value of the main component for the control thereof and the flow of the main component is controlled such that a control value (actual value) thereof corresponds to the desired value, and controlling the flow of the secondary component by using the control value (the actual value) of the flow of the main component for determining the desired value of the flow of the secondary component in the predetermined ratio to this control value, and having one pressure vessel containing the main component and one pressure vessel containing the secondary component, an analog measuring transducer which produces an electrical value proportional to the actual flow of the main component, a first servo controlled system including a first geared pump for feeding the secondary component in the first servo controlled system, a first electrical machine which is operatable as a motor and drives the first geared pump, the geared pump forming a first regulating element with the first electrical machine, a first electronic four-quadrant controller for the first electrical machine and a digital potentiometer for adjusting to the predetermined ratio the quantities of the secondary component relative to the main component, the improvement further comprising

a second servo controlled system for the main component, including

a geared pump means for feeding the main component in the second servo controlled system, said geared pump means being arranged between the pressure vessel containing the main component and said measuring transducer, the latter also constituting a part of the second servo controlled system,

a second electrical machine which is operatable as a motor and constitutes means for driving said geared pump means for the main component,

said geared pump means with the second machine associated therewith forms a second regulating element, and

a second electronic four-quadrant controller operatively connected to said second electrical machine associated with the main component and with said measuring transducer, and

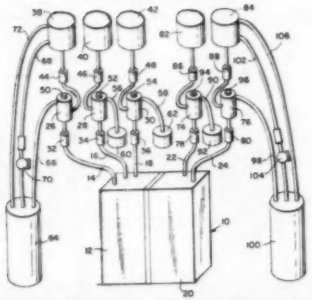
two tacho-generators are coupled with respectively each said first and second electrical machines and said first and second electronic four-quadrant controllers and constitute parts of said first and second servo controlled systems,

said digital potentiometer is connected to an electrical connection line in said second servo controlled system between one of said tacho-generators and said second electronic four-quadrant controller, said first electronic four-quadrant controller being also connected to said first electrical machine and connected to said digital potentiometer.

4,440,315
AUTO FLOW SYSTEM

Lev Slobodnik, 185-01 Hillside Ave., Apt. 5-P, Jamacia, N.Y. 11432

Filed Nov. 20, 1981, Ser. No. 323,652
Int. Cl.³ B67D 5/08
U.S. Cl. 222—56 9 Claims



1. An automatic flow system for a mixing device which produces level signals corresponding to the quantity of the solution in the device, said system comprising:

a plurality of containers, each retaining a respective predetermined volume in accordance with desired mixing proportions;

a first plurality of control valves respectively controlling the flow between said containers and said device;

a plurality of storage drums;

a second plurality of control valves respectively controlling the flow between said storage drums and said containers;

a control circuit responsive to a low level signal from said mixing device for operating said first plurality of control valves to supply said mixing device with said predetermined volumes, and responsive to a high level signal for closing said first plurality of control valves and opening said second plurality of control valves to refill said containers from said storage drums; and

said system further comprising at least one supply tank coupled to a corresponding one of said storage drums, and pump means controlling the flow between said supply tank and said corresponding storage drum, said pump means responsive to the high level signal for commencing operation, and stop operation by means of the limit switch on one of said plurality of containers.

4,440,316

COMBINED PIERCER AND VALVE FOR FLEXIBLE BAG

William C. Christine, Catasauqua, Pa., assignor to Trinity Associates, Nazareth, Pa.

Continuation-in-part of Ser. No. 124,971, Feb. 27, 1980, abandoned, and Ser. No. 317,261, Nov. 2, 1981, abandoned. This application Jun. 11, 1982, Ser. No. 387,436

Int. Cl.³ B67B *7/26*

U.S. Cl. 222—83.5 **2 Claims**

1. A valve for use with a flexible film bag comprising a valve body including a first flange secured to the outer surface of said bag, a second flange spaced outwardly from said first flange, said valve body including a cylindrical portion, a third flange adjacent to the outer end of said cylindrical portion, there being a plurality of radially disposed slits in said third flange, an outwardly projecting portion on the outer end of the cylindrical portion, and said outwardly projecting portion having slots registering with said slits, a resilient deformable cap engaging the outwardly projecting portion of said valve body, a circular valve seat on the inner portion of said body, there being a plurality of concentric ridges on said valve seat, a wall portion on the outer end of said valve body, there being a central opening in said wall portion, a movable piercer including a shaft portion projecting through the opening in said wall portion, a snap through connector on the outer end of said shaft portion engaging said cap, a valve element on said shaft portion mounted for movement into and out of opened and closed relation with respect to said valve seat, said piercer including on its inner end a cutting edge, said piercer including a cylindrical section having longitudinally extending grooves in its outer surface, there being a discharge spout in the lower end of said valve body.

4,440,317

STERILE LIQUID STORING AND DISPENSING APPARATUS

James A. Clark, Honeoye Falls, and Henry J. Emmel, Irondequoit, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 28, 1981, Ser. No. 297,383

Int. Cl.³ B65D *35/28*

U.S. Cl. 222—103 **11 Claims**

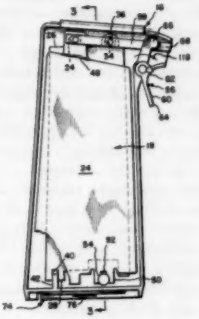
1. A sterile liquid storing and dispensing apparatus, comprising:

a sealed flexible container for sterile liquids and having an integral dispensing spout therein;

a housing for said sealed flexible container, said housing including first and second portions being cooperatively engageable so as to facilitate access to and retention of said sealed flexible container, said housing further including an aperture therein being configured to receive said dispensing spout;

pressure means pivotally mounted to one of said first and second housing portions for engaging said sealed flexible container to exert a continual pressurizing force thereon when said sealed flexible container is positioned within said housing; and

a selectively operable valve mounted in said housing so as to press against said dispensing spout to normally close said dispensing spout in a first position and being movable to a second position to release pressure to permit opening of said spout, said pressure means exerting continual pressure against said sealed flexible container and forcing liquid therefrom when said valve is in its second open position



until said valve returns to its first closed position, the continual pressurizing force being exerted on said flexible container by said pressure means preventing outside contaminants from being transmitted back to the liquid within said sealed flexible container.

4,440,318

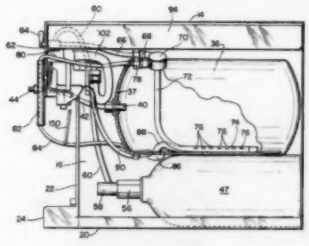
BEVERAGE DISPENSER

Irving Berger, 2170 NE. First Ave., Boca Raton, Fla. 33432

Filed Mar. 11, 1980, Ser. No. 129,205

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—129.1 **14 Claims**



1. A portable beverage dispenser for use in a refrigerator comprising a housing, a water container located in said housing and having a water inlet joined thereto for receiving water from a source for introduction into said water container, a water connector mounted in said housing at the front thereof for exterior access thereto, said water connector being interconnected to said water inlet that is joined to said water container, and a flexible hose disconnectably secured to said water connector and to a tap water outlet for directing tap water to the interior of said water container, and a carbonated water outlet communicating with the interior of said water container, a gas vessel located in said housing adjacent to said water container and having a carbon gas under pressure therein, a gas conduit extending from said gas vessel and communicating with the interior of said water container, means connected to said gas vessel for periodically supplying said carbon gas to said water container through said gas conduit, wherein said gas cooperates with said water upon refrigeration thereof to produce carbonated water in said water container, a dispensing assembly mounted on said housing and including a plurality of dispensing valves, one of which communicates with said water container for receiving carbonated water therefrom, at least

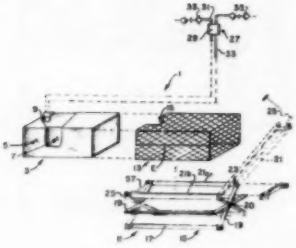
one syrup container mounted in said housing and communicating with another of said dispensing valves for directing syrup thereto, said dispensing assembly further including a mixing chamber with which said valves communicate, and means joined to said dispensing assembly for actuating said valves for simultaneously introducing the carbonated water and syrup into said mixing chamber for mixing therein, whereafter the carbonated mixture is dispensed into a drinking container, a second syrup container mounted in said housing, said dispensing assembly including at least one other dispensing valve that has communication with said second syrup container, and a flavor selector device that is engageable with said dispensing valves and that is movable into engagement with a selected valve to provide for the combined dispensing of a selected syrup and said carbonated water to obtain the carbonated mixture in the drinking container, said selector device being laterally movable to simultaneously engage the valve for dispensing said carbonated water and a selected syrup valve for jointly introducing the carbonated water and selected syrup into said mixing chamber for the dispensing of the carbonated mixture into said drinking container.

4,440,319

SYSTEM, APPARATUS, AND METHOD OF DISPENSING A LIQUID FROM A SEMI-BULK DISPOSABLE CONTAINER

Harold L. Nitchman, 1230 Parody, St. Charles, Mo. 63301, and William B. Cunningham, Jr., 916 Woodshire La., St. Louis, Mo. 63141

Filed Jul. 21, 1981, Ser. No. 285,611
Int. Cl.³ B67D *5/60*; F25J *5/60*
U.S. Cl. 222—131 **29 Claims**



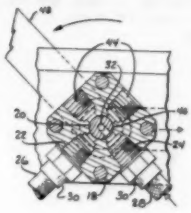
1. A system for dispensing of a liquid from a container containing a supply of said liquid therein, said container being of liquid impervious construction and having at least one opening therein, means sealably cooperable with said at least one opening of said container for permitting pressurization of said liquid within said container and for pressure dispensing said liquid from within said container, and pressure containment means for receiving and for withstanding pressure forces exerted on said container during dispensing of said liquid from therewithin said pressure containment means comprising a containment vessel incapable of sealably holding gas pressure therewithin for receiving said container and a frame into which said containment vessel with said container received therein is removably installed, said container having axial and circumferential pressure forces applied thereto when internally pressurized, said frame at least in part carrying said axial pressure forces applied to said container and said containment vessel at least in part carrying said circumferential pressure forces and substantially limiting expansion of said container upon internal pressurization of said container.

4,440,320

FOAM DISPENSING APPARATUS

Steven A. Wernicke, 407 E. Elm, Wheaton, Ill. 60187

Filed Nov. 30, 1981, Ser. No. 325,907
Int. Cl.³ B67D *5/60, 1/08, 5/08*
U.S. Cl. 222—145 **6 Claims**



1. A foam dispenser for converting a plurality of foam components into an expanded foam and having means for flushing the dispenser with a cleaning solution after the foam is discharged comprising, in combination:

(a) a barrel having a plurality of passages formed therein which communicate with a mixing chamber;

(b) a nozzle connected to the barrel having a bore therethrough, one end of which communicates with the mixing chamber while the other end provides an opening for discharging the expanded foam from the dispenser;

(c) a tube for carrying each foam component to the dispenser, each such tube having a corresponding tube for carrying the cleaning solution to the dispenser;

(d) a rotary valve member for each pair of foam component and cleaning solution tubes, each such valve having a single passageway formed therethrough with an inlet and outlet, each valve being mounted for movement on the barrel so that the inlet of each valve is rotatable between positions nearly coterminous with the outlets of the foam component tubes and the cleaning solution tubes, and the outlet of the valve remains in communication with the mixing chamber; and

(e) means for moving all valves in unison between communication with the foam component carrying tubes and communication with the cleaning solution carrying tubes so that after the foam components have been mixed and the expanded foam discharged from the dispenser the entire dispenser, from the point where the foam components enter the dispenser, can be flushed with the cleaning solution.

4,440,321

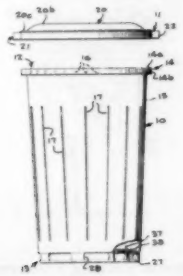
DEBRIS RECEPTACLE, COVER, AND CONTENTS COMPRESSOR AND DISCHARGE ASSEMBLY

Robert G. Campbell, Collingswood, and Warren A. Campbell, III, Audubon, both of N.J., assignors to Hilldale Enterprises, Annapolis, Md.

Filed Jun. 16, 1982, Ser. No. 389,451
Int. Cl.³ B67D *5/32*; B65D *90/00*
U.S. Cl. 222—153 **8 Claims**

1. A receptacle and cover assembly for collecting lawn debris and the like and including means for assisting transfer of the contents to expendable lawn trash bags and the like, comprising a main receptacle body section in the shape of an upwardly opening container having a lateral side wall terminating in a lip formation at the upper end thereof bounding the top opening and a lower edge formation at the bottom of the receptacle body section for supporting the same in upright position on a supporting surface, a removable cover member for said receptacle body section, the body section having a centrally open outer bottom wall portion extending inwardly from the side wall at a position spaced slightly above said lower edge formation defining an inwardly projecting shelf-

like ledge extending inwardly from the side wall as an encircling formation bounding the center opening thereof, a moveable bottom panel member forming a discharge assist piston providing collectively with said outer bottom wall portion the bottom of the receptacle having its outer peripheral portions overlying the shelf-like ledge formation and collectively therewith forming the bottom of the receptacle, the center opening in said bottom wall portion being large enough for passage of the operator's hand therethrough to manually engage and force said bottom panel member from the bottom wall portion of said receptacle body section toward the open upper end



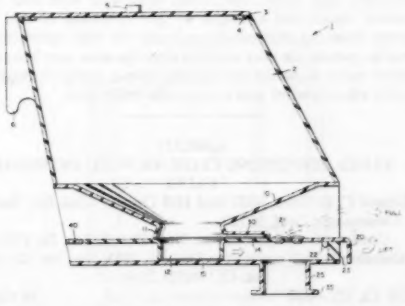
thereof when the cover is removed and an expendable debris collecting bag is fitted over the receptacle body portion to facilitate transfer of the contents of the body section into the expendable bag, said receptacle body portion and said bottom wall portion being formed of resiliently deformable molded plastic material, said bottom panel member having catch formations integrally formed thereon, and said bottom wall portion having integrally formed slots for receiving and releasably interlocking with said catch formations for releasably restraining the bottom panel member latched to the bottom wall portion.

4,440,322

DISPENSER FOR NUTS OR THE LIKE

Joseph D. Henry, 2728 E. Huntington, Duarte, Calif. 91010

Filed Sep. 28, 1982, Ser. No. 425,298
Int. Cl.³ G01F *11/10*
U.S. Cl. 222—153 **5 Claims**



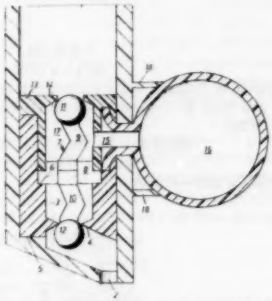
1. A dispenser of small objects of similar size comprising:
a hopper for said objects having a top opening;
a lid adapted to close said opening and fitted thereto;
said hopper having a funnel shaped bottom leading downwardly to a circular gate;
said gate having further a conical extension which diverges downwardly and which ends in a lower edge which is everywhere in the same horizontal plane;
a transfer slide mounted for limited horizontal movement immediately adjacent the lower edge of said gate;
a bottomless measuring cup formed in said transfer slide of such size and so located as to be in register with said gate when said transfer slide is in one of its limits of movement;
a horizontal stationary bottom plate located immediately adjacent the lower edge of said measuring cup;
said horizontal bottom plate having an opening herein of such size and so located as to be in register with said bottomless measuring cup when said transfer slide is in its other limit of movement;
a chute depending from the edges of the said opening in said bottom plate;
handle means articulated to said transfer slide whereby said transfer slide may be manually moved horizontally between its limits of motion;
said handle means being provided with catch means, which must be released by lifting the handle, before the handle means can be used to move said transfer slide.

4,440,323

DEVICE FOR DISPENSING METERED QUANTITIES OF FLUID FROM A CONTAINER

Gustav E. V. Benson, Malmö, Sweden, assignor to Patra AG, Lucerne, Switzerland

Filed Nov. 9, 1981, Ser. No. 319,729
Claims priority, application Sweden, Nov. 12, 1980, 8007934
Int. Cl.³ G01F *11/32*
U.S. Cl. 222—209 **8 Claims**



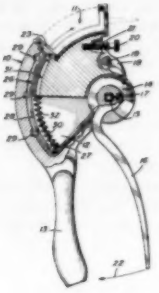
1. In a device for dispensing metered quantities of fluids from a container said device comprising a through-flow passageway having a fluid outlet opening, a valve chamber in said passageway, and a pressurizing bulb in communication with said valve chamber, an upper valve seat and a lower valve seat, said upper and lower valve seats delimiting said valve chamber, an upper valve body arranged to be pressed against said upper valve seat into sealing position in response to an excess pressure in said valve chamber but to be pulled away from said upper valve seat to expose the latter in response to a vacuum pressure in said valve chamber, a lower valve body arranged to be pulled against said lower valve seat into sealing position against the latter in response to a vacuum pressure in said valve chamber but to be pressed clear away from said lower valve seat so as to open the latter in response to an excess pressure in said valve chamber, the improvement comprising a plate positioned in said valve chamber between said valve bodies, said plate being arranged to allow passage of fluid, and resilient arm members interconnecting said valve bodies and said plate.

4,440,324

CARTRIDGE-TYPE DISPENSER GUN

Maurice Lebecque, 7849 Bloomfield St., Apt. 3, Montreal, Quebec, Canada H3N 2H4

Filed Jun. 4, 1982, Ser. No. 385,309
Int. Cl.³ B67D 5/42, 5/46
U.S. Cl. 222—326 15 Claims



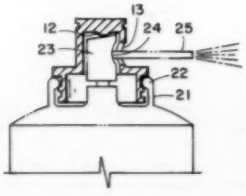
1. A cartridge-type dispenser gun comprising a body defining a longitudinally arc-shaped cartridge chamber, a hand-controlled actuation assembly operatively connected to said body, a piston connected to the actuation assembly and displaceable longitudinally in the cartridge chamber, a pawl and ratchet assembly connected to the hand-controlled actuation assembly and stepingly holding the piston in advanced position in the cartridge chamber, and spring means connected to the piston and operatively retracting the same in the cartridge chamber upon release of the pawl and ratchet assembly.

4,440,325

ACTUATOR

Martin B. Treuhaft, 3434 Fallen Leaf, San Antonio, Tex. 78230, and Knut L. Winquist, 326 E. Glenview, San Antonio, Tex. 78201

Filed Jul. 24, 1981, Ser. No. 286,479
Int. Cl.³ B65D 83/14
U.S. Cl. 222—402.14 5 Claims



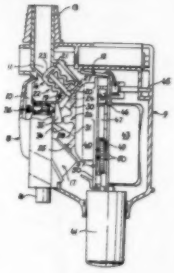
1. An acutator for an aerosol-type container having a spring loaded valve member, said container having an annular collar provided with an annular protruding portion, said actuator having a radially projecting flange portion from which depends an annular resilient collar, said collar being provided with parallel upper and lower annular grooves, said grooves being dimensioned to engage about and couple with said annular protruding portion, whereby when said annular protruding portion is engaged with the lower groove said container valve is maintained in an unactuated position and when said annular protruding potion is engaged with the upper groove said container valve is in and is restrained in an actuated position.

4,440,326

DISPENSING DEVICE

Peter K. Bayly, Eltham North, and John E. Oretti, Doncaster, both of Australia, assignors to Peter Bayly Associates Australia Pty., Australia

Filed Jun. 4, 1981, Ser. No. 270,369
Claims priority, application Australia, Jun. 6, 1980, PE3938
Int. Cl.³ G01F 11/28
U.S. Cl. 222—450 9 Claims



1. A dispenser device including, a metering chamber having an inlet port and an outlet port, an inlet valve operative to open and close said inlet port in fill and discharge conditions respectively of said metering chamber, an outlet valve operative to close and open said outlet port in said fill and discharge conditions respectively, each said valve including a tail portion extending externally of said metering chamber, valve control means which is movable between two extreme conditions, the arrangement being such that said fill condition exists at one of said extreme conditions and said discharge condition exists at the other, said valve control means including an inlet valve control arm and an outlet valve control arm respectively associated with said inlet and outlet valves, the valve control arms being pivotally movable relative to the metering chamber, a portion of each valve control arm being operatively associated with the tail portion of the associated valve so the pivotal movement of each control arm causes operation of the associated valve, actuator means operative to cause movement of said valves to effect a change of the said condition of said metering chamber, said actuator means having start and activated conditions, said start condition corresponding to said fill condition of said metering chamber, and said actuator means including cam means operatively associated with said valve control means and arranged so that operation of said cam means from the start condition causes the inlet valve control arm to operate the inlet valve to close the inlet port before the outlet valve is caused by the cam means acting through the outlet valve control arm to open the outlet port.

4,440,327

FLUID DISPENSING CLOSURE WITH INTEGRAL VALVE

Richard C. G. Dark, 8553 Red Hill Country Club Dr., Rancho Cucamonga, Calif. 91730

Continuation-in-part of Ser. No. 228,212, Jan. 26, 1981, abandoned. This application Dec. 16, 1981, Ser. No. 331,162
Int. Cl.³ B65D 25/46
U.S. Cl. 222—530 31 Claims

1. A unitary dispensing closure and valve for cooperation with an associated container, comprising:

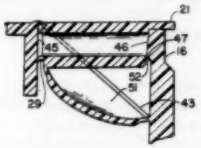
a rigid base defining a seal surface and a rigid latch surface,

a rigid spout having a dispensing passage, a first end portion connected with the rigid base at a rectilinear pivot line hinge, and a dispensing second end portion,

an invertible diaphragm connected to the outlet spout by a first hinge continuous with the pivot line and defining

therewith a continuous hinge about the spout first end portion, said invertible diaphragm being connected to the rigid base by a second hinge,

said pivot line and said second hinge defining a continuous hinge disposed in a common bi-sector plane which bisects an angle between said rigid base seal surface and inside surface of the outlet spout when the spout is in its dispensing position, said pivot line, first hinge and second hinge cooperating to invert the invertible diaphragm during pivoting movement of the outlet spout about the pivot line between its sealed and dispensing positions, the movement of the outlet spout to the sealed position being governed



by pivoting of the spout about said rectilinear pivot to collapse the invertible diaphragm through the bi-sector plane, said invertible diaphragm being disposed in a convexed configuration when the spout is in its dispensing position and being disposed in a concaved configuration when the spout is in its sealed position,

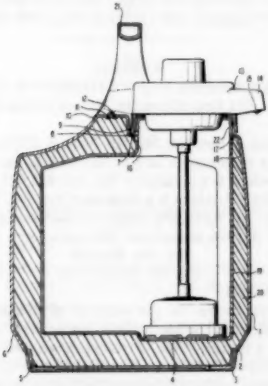
resilient fluid seal means configurated and positioned to provide sealing between the base seal surface and the first end portion of the outlet spout about said dispensing passage when the outlet spout is in its said sealed position, and means on said base for attaching the closure to the associated container.

4,440,328

WIDE-MOUTHED ISOTHERMAL CONTAINER WITH INTEGRATED HANDLE EQUIPPED WITH IMMERSED PUMP

Elias M. De Freitas, Gomes, Brazil, assignor to Termolar S/A, Porto-Alegre-RS, Brazil

Filed Jan. 26, 1982, Ser. No. 342,987
Int. Cl.³ B67D *5/40*
U.S. Cl. 222—538 **8 Claims**



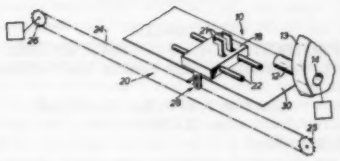
1. A wide-mouthed isothermal container having an integrated handle equipped with an immersed pump comprising an outer case (1) having curved side walls (6); and a curved upper wall (10) of a horizontal section and a parabolic section; a bottom portion (3); a circular passage opening (7) in said upper wall; said horizontal section of said upper wall further having a semi-cylindrical depression and a horizontal surface (8) at the bottom of said semi-cylindrical depression; a handle (21) integral with said outer case and enclosing an empty space (23); the said horizontal section of said upper wall forming a horizontal plane (11) and provided with a hump (12); a pump (13) fitted to said container, said pump being mounted at said circular passage opening and positioned in the semi-cylindrical depression, whereby, the pump is mounted eccentrically to the central vertical axis of the container so that a spout of the pump projects outwardly from the outer case when the spout is in a pouring position; said spout having (14) an outlet (15) adapted to engage said hump (12) when the spout is rotated to a non pouring position.

4,440,329

APPARATUS FOR UNLOADING HOSIERY MACHINERY

Michael J. Hodges, High Wycombe, England, assignor to Dextomat Machinery Limited, England

Filed Jan. 22, 1982, Ser. No. 341,639
Int. Cl.³ D05B *21/00*
U.S. Cl. 223—43 **6 Claims**



1. Apparatus for use in the hosiery manufacturing industry, comprising a hollow hose carrier open at at least one, forward end thereof, means for creating suction in the carrier, and a hose unloading mechanism associated with the carrier and operable to unload said carrier and to convey unloaded hose to a position forward thereof; said unloading mechanism including: a movable carriage, drive means to move said carrier to and fro along a guide path extending forwardly thereof, means supported by said carrier and operable at a position remote from the forward end of said carrier to take hold of a portion of a hose thereon during a forward or unloading movement of said carriage; and means for controlling said suction-creating means whereby suction is applied while said hose portion is displaced forwardly of said carrier, to evert the hose during an initial stage of the unloading operation.

4,440,330

REAR CARRIER FOR MOTORCYCLES AND THE LIKE

Clarence R. Goodman, 4727 W. Marlette, Glendale, Ariz. 85301

Filed Oct. 23, 1981, Ser. No. 314,176
Int. Cl.³ B62J *7/04*
U.S. Cl. 224—30 R **6 Claims**

1. A rear mounted carrier for a cycle having a frame comprising:

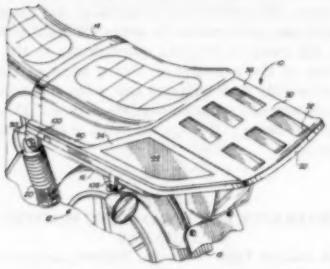
(a) a substantially horizontal platform defining a load supporting surface, said platform having front, rear and opposite sides;

(b) support arms secured at the opposite sides of said platform, said arms extending generally forwardly at either side of the platform, said platform and arms being plastic and injection molded as a unitary structure;

(c) metal reinforcing channel means extending along the inner side of each of said support arms, said metal reinforcing channel means being generally U-shaped having a web portion and extending flanges, the flanges of said reinforcing channel means engaging said support arms;

(d) boss means extending between said metal reinforcing channel and said support arms at predetermined spaced apart locations; and

(e) mechanical fastener means extending at selected of said



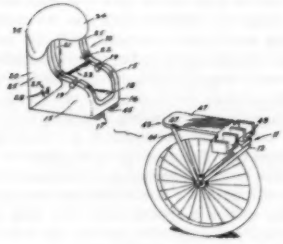
bosses between said metal reinforcing channel and said support arm and securing the same together whereby loads imposed at the points of attachment of said support arms and reinforcing channel are distributed along the carrier when said platform is secured to said vehicle.

4,440,331

PROTECTIVE CHILD CARRIER ASSEMBLY

Kristin L. Schimmels, S. 2211 Conklin Rd., Veradale, Wash. 99037

Filed Dec. 3, 1981, Ser. No. 327,248
Int. Cl.³ B62J *7/04*
U.S. Cl. 224—31 **12 Claims**



1. A protective child carrier assembly capable of being interchangeably mounted to either an automobile having a seat and safety seat belt, or a bicycle having a rigid frame, said carrier assembly comprising:

a base section having a smooth downwardly facing flat bottom surface for supporting the carrier assembly on the seat of a an automobile, and an opposite upwardly facing top surface for receiving and supporting a child;

said base section having a forwardly open slot formed therein adjacent the smooth flat bottom surface;

means on the base section for releasably receiving a safety seat belt of an automobile to selectively secure the base to the vehicle;

a backrest section having a back support surface;

pivot means mounting the backrest section to the base section for adjustably securing the backrest section at a selected angular position in relation to the base section;

an elongated bicycle mounting bracket having opposed longitudinal side edges adapted to be releasably received within the forwardly open slot of the base section by sliding motion of the base section forwardly over the bracket;

said mounting bracket side edges each having a notch formed therein;

latch means adjacent the flat bottom surface of the base section and on opposite sides of the forwardly open slot for releasably securing the base and backrest sections to the bicycle mounting bracket with the latch means engaging the notches; and

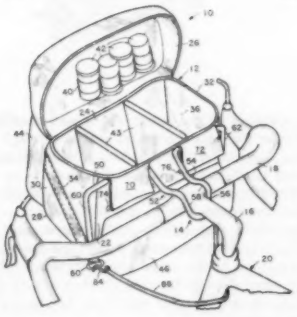
means for securing the bicycle mounting bracket to the rigid frame of a bicycle.

4,440,332

REINFORCED BICYCLE PACK

Thomas W. Kullen, 848 E. Bryan Ave., Salt Lake City, Utah 84105

Filed Dec. 30, 1982, Ser. No. 454,835
Int. Cl.³ B62J *7/06*
U.S. Cl. 224—36 **12 Claims**



1. A reinforced bicycle pack comprising:

a bag having a back, front, top, bottom and two sides;

a sleeve on each side extending from the back, bottom area toward the front, top area; and

a support frame having a lateral portion extending along the back, top of the bag, two leg portions extending downwardly toward the bottom of the bag, and two angled portions extending from the back, bottom area toward the front, top area, one received in each of said sleeves to support and erect the bag;

means for attaching said lateral portion to the bag; and

means for engaging said lateral portion with the bicycle.

4,440,333

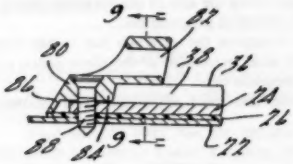
ARTICLE CARRIER FOR AUTOMOTIVE VEHICLES

John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 242,138, Mar. 9, 1981, abandoned, which is a continuation of Ser. No. 56,373, Jul. 10, 1979, abandoned, which is a division of Ser. No. 924,072, Jul. 7, 1978, Pat. No. 4,182,471, which is a division of Ser. No. 743,602, Nov. 22, 1976, Pat. No. 4,099,658, which is a continuation of Ser. No. 486,415, Jul. 8, 1974, abandoned. This application Apr. 18, 1983, Ser. No. 485,859
Int. Cl.³ B60R *9/00*
U.S. Cl. 224—324 **11 Claims**

1. An article carrier for the trunk lid of an automobile, said trunk lid extending horizontally as an exterior body surface and having a leading edge, a trailing edge, and laterally disposed side edges, including a plurality of parallel slats fixedly secured on said horizontally extending exterior body surface, extending from adjacent said leading edge to adjacent said trailing edge, and lying closely against said surface in a low profile configuration throughout the entire length of said slat, each of said slats having a generally horizontal transverse cross-sectional width greater than its cross-sectional vertical height, and each said slat having an upper article supporting

surface, extending the length thereof; a bracket secured to the laterally outermost slats disposeable adjacent said side edges at the end of said slats adjacent the trailing edge of said body surface; an elevated restraining bar supported by said brackets and extending laterally across said slats and said body surface; and end cap means including integral tie down means directly



fixedly secured to said body surface and operably associated with at least the intermediate slats of said carrier and cooperable with said slats to restrain articles disposed on said slats substantially out of contact with said body surface, said end cap means disposed at least at the ends of said slats adjacent the leading edge of said body surface.

4,440,334

ADJUSTABLE CAMERA STRAP CONSTRUCTION

Joseph Kappel, Hewlett, and Richard Goldberg, Scarsdale, both of N.Y., assignors to Coast Manufacturing Co., Inc., Mt. Vernon, N.Y.

Filed May 5, 1983, Ser. No. 491,845
Int. Cl.³ A45F 5/00
U.S. Cl. 224—258 **2 Claims**

1. An improved adjustable camera strap construction which comprises:

(a) a shoulder strap;

(b) means adjustably secured to said strip to accommodate the length thereof in accordance with the particular physique of the user;

(c) at least one belt hook made of a rigid durable material, receiving said strap at one end; and

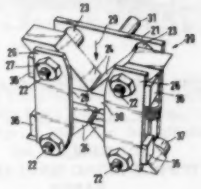
(d) said belt hook carrying a latch having means to detachably engage a standard mounting post of a camera body, said hook has an opening defined at one end thereof for receiving said strap, and a narrowing portion at the other end, said narrowing portion forming a triagular finger having an opening defined in a flat portion thereof, said flat portion being perpendicular to the main body of said hook, said opening receiving said latch, whereby the belt hook will durably secure the strap to the latch hook during the useful life of the construction.

4,440,335

SUPPORT ROD STEAMER ROD LOCK

Valentin Appenzeller, Kempen, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,324
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012756
Int. Cl.³ B65H 17/18, 17/54
U.S. Cl. 226—107 **12 Claims**



1. In a rod lock for a support rod steamer for steaming webs of textile and similar materials, said steamer including a guide at the beginning thereof and extending over the length of said steamer; a support rod conveyor endlessly revolving in the loop plane of the material to which rod locks are attached, said conveyor conveying support rods in a loop from the end of said guide to the beginning of said guide, each rod lock comprising a base body firmly connected to said support rod conveyor having a slot open on both sides in the travel direction of the conveyor, for receiving the end of a support rod and a locking element arrangement rotatable relative to the base body in a plane of the loops for closing off openings of the slot when a support rod has been received at the end of said guide, and an external control cam for releasing said locking element arrangement in order to release the support rod at the beginning of said guide, the improvement comprising said locking body arrangement comprising:

(a) at least first and second locking elements arranged in tandem spaced from each other in the direction of the slot supported in axes perpendicular to the plane of the loops;

(b) means resiliently biasing said rotatable locking elements into a position of rotation in which they lock the receiving region of the slot from the outside but so that the leading locking elements can be rotated out of the slot merely by the weight of the support rod; and

(c) stops against which said rotatable locking elements are resiliently held.

4,440,336

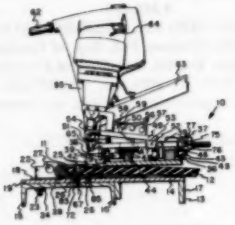
APPARATUS FOR ATTACHING FASTENERS TO BELTS

Harry T. Kifor, Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 2, 1981, Ser. No. 279,716
Int. Cl.³ B27F 7/14
U.S. Cl. 227—4 **7 Claims**

1. Apparatus for riveting a plate member of a belt fastener having a plurality of holes to an edge portion of a belt comprising a supporting structure including a way, a rivet driving means mounted on a carriage movable on said way for movement to a plurality of riveting positions over said holes in said plate member positioned over said edge portion, said carriage including a hinged support on which said rivet driving means is mounted for movement towards and away from said belt and said belt fastener, guide means for directing said rivet driving means to said riveting positions over said holes in said plate member, said rivet driving means being actuated in response to movement of said rivet driving means into each of said riveting

positions for insertion of a rivet through each of said holes in said plate member and into said edge portion and resilient



means for urging said hinged support away from said belt fastener.

4,440,337

METHOD OF PRODUCING SIMILAR DEEP-DRAWN PARTS

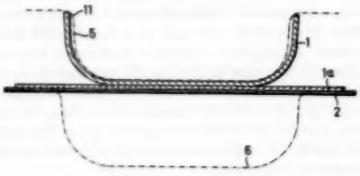
Rolf Eckert, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Oct. 8, 1981, Ser. No. 309,724

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038276

Int. Cl.³ B21C *37/08;* **B21D** *22/20*

U.S. Cl. 228—173 C **4 Claims**



1. A method of producing a series of similar deep-drawn parts, for double-walled structural parts having uniformly spaced walls and edge welding, using a tool having a punch and a lower portion for receiving material from, and shaping it in cooperation with, said punch, said method, for each deep-drawing procedure, comprising the steps of:

placing a planar outer plate on said lower tool portion;

placing a planar filler plate upon said outer plate;

placing a preformed inner plate over said punch;

placing said punch, with said inner plate thereon, on said filler plate in such a way that said inner plate is located between said punch and said filler plate;

in common shaping said outer plate, said filler plate, and said inner plate in such a way that said outer and inner plates receive their final form, and said filler plate is deformed;

removing said filler plate from between said formed outer and inner plates; and

using said formed filler plate as the preformed inner plate in producing a subsequent deep-drawn part.

4,440,338

FRICTION WELDING MACHINE

Christopher T. S. Stevenson, New Britain, Conn., assignor to Litton Industrial Products, Inc., New Britain, Conn.

Filed Dec. 10, 1981, Ser. No. 329,248

Int. Cl.³ B02C *31/00*

U.S. Cl. 228—2 **2 Claims**

1. In a friction welding machine having a horizontally displaceable workhead assembly including a rotatable chuck for gripping and rotating a first tubular workpiece about its axis and a means for securing a secured tubular workpiece in a stationary position axially aligned opposite one end of the first workpiece gripped by said chuck, an integral shear for shearing internal weld flash formed by the friction welding operation, the integral shear comprising:

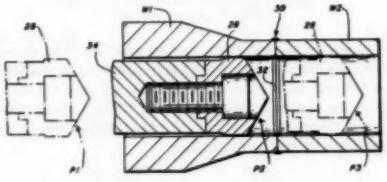
a shear tool mounted on the end of a shear bar,

a shear cylinder and piston for displacing the shear bar and shear tool along the axis of the rotatable chuck,

a slideably mounted program bar,

means for coupling the program bar to the shear piston whereby axial movement of the shear piston is followed by the program bar,

first, second, and third adjustable cams mounted on the



program bar and defining remote, ready, and advanced positions of the shear tool with respect to said tubular workpieces, and

first, second, and third switches engagable by the first, second, and third cams to define the location of the shear tool at remote, ready, and advanced positions, respectively, within said tubular workpieces, whereby during a friction welding cycle said shear tool may be advanced from a remote position within one of said workpieces, to a ready position adjacent the weld area of said two workpieces, then to an advanced position in the other of said workpieces past the weld area in order to shear internal weld flash, and thereafter back to said remote position.

4,440,339

METHOD OF REPAIRING HOUSING OF CONTROL ROD DRIVING SYSTEM

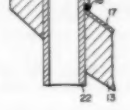
Yasumasa Tamai, and Takaichi Koyama, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 12, 1981, Ser. No. 272,882

Claims priority, application Japan, Jun. 19, 1980, 55-83757

Int. Cl.³ B23K *31/06*

U.S. Cl. 228—119 **9 Claims**



1. A method of repairing the housing of a control rod driving system of a nuclear reactor, said housing being inserted through the wall of a pressure vessel of said reactor into a cylindrical sleeve secured to the inner surface of said vessel which housing is jointed by welding to said cylindrical sleeve, said method comprising the steps of:

cutting said housing in the circumferential direction of the housing at a portion thereof positioned between the weld joint and the inner surface of said reactor vessel and surrounded by said cylindrical sleeve, thereby to divide said

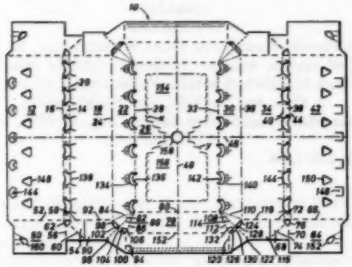
housing into a first housing part still secured to the weld joint and another removable housing part;
removing said removable housing part;
inserting a second housing part into said cylindrical sleeve through the wall of said nuclear reactor vessel; and
uniting said first housing part and said second housing part by welding thereby to form a new housing for said control rod driving system.

4,440,340

FULLY ENCLOSED WRAP-AROUND CARTON

Martinus C. M. Bakx, Roosendaal, Netherlands, assignor to The Mead Corporation, Dayton, Ohio

Filed May 28, 1982, Ser. No. 383,085
Claims priority, application United Kingdom, May 29, 1981, 8116393
Int. Cl.³ B65D 5/02, 75/08
U.S. Cl. 229—40 4 Claims



4. An elongate blank for forming a carton of the wrap-around type, which blank comprises a first bottom wall panel (12), a first side wall panel (18,22), a top wall panel (26), a second side wall panel (30,34), and a second bottom wall panel (42), hinged one to the next along transverse fold lines so that the blank can be folded into a tubular structure, each of said bottom, top and side wall panels having an end closure panel hinged thereto along each of its longitudinal edges for closing the ends of the tubular structure, characterized in that each top wall end closure panel is hinged at each of its ends to an adjacent side wall panel by a web panel structure comprising a side wall end closure panel (116) and a gusset panel (108) which panels have adjacent edges spaced a part by an aperture (124,126) struck from the blank and hinged together by a bridging piece (128) spanning the aperture.

4,440,341

RETURN ENVELOPE MAILER

Thomas G. Pennock, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Nov. 3, 1982, Ser. No. 438,787
Int. Cl.³ B65D 27/10
U.S. Cl. 229—69 6 Claims

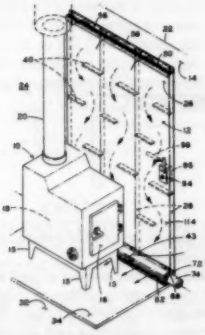
1. A continuous business form assembly comprising a first web, a second web, a third web and a fourth web, all the webs being continuous in a longitudinal direction, and having a transverse extent perpendicular to the longitudinal direction, the first web also having longitudinally spaced, transversely extending flaps, the flaps each having cut edges and a folded edge, the flaps being folded and thereby providing openings in the first web adjacent the flaps, the second web having openings longitudinally and transversely substantially aligned with the openings of the first web, the second web being joined to the first web to form return envelopes such that the flaps are return envelope flaps, and the third web being joined to the fourth web, in part through the openings of the first and second webs, and the third and fourth webs being adapted to form originating envelopes including therein the return envelopes.

4,440,342

HEAT DISPERSING THERMAL BARRIER

Rodger H. Flagg, 1415 Lynn Ave., Ft. Wayne, Ind. 46805

Filed Apr. 1, 1981, Ser. No. 250,055
Int. Cl.³ F24D 5/00
U.S. Cl. 237—50 15 Claims



1. An apparatus for actively dispersing heated air in spaced proximity to a free-standing heating device installed in a room having combustionable materials forming at least in part a floor, a ceiling, and a plurality of walls therebetween, which comprises:

(a) a vertically disposed heat-resistant room confronting outer panel adapted to extend from near the ceiling to near the floor in spaced relation from the room wall, and adapted to extend along the wall a distance sufficient to provide suitable thermal protection to the combustionable wall in spaced proximity to the heating device;

(b) a vertically disposed, heat resistant wall confronting inner panel, said inner panel adapted with a plurality of vertically disposed spaced apart convolutions adapted to extend to abut said outer panel in a manner to form a plurality of vertically aligned fluid passages between said inner and outer panels and said convolutions;

(c) a horizontal chamber having opposing sides and ends, and adapted to extend substantially across one end of the vertically aligned fluid passages; and

(d) an air blower adapted with an inlet and outlet port, with one port adapted to be in fluid communication with the horizontally disposed chamber, and the other port adapted to be in fluid communication with the room air, said inlet and outlet ports positioned in relation to the horizontal chamber in a manner to force air downwardly through the plurality of vertically aligned fluid passages to draw radiant heat from the heating device through the outer panel by conduction, and to disperse the heat by convection to the passing air, wherein: the heat resistant outer panel provides thermal protection to the combustionable wall in proximity to the heating device, allowing

closer positioning of the heating device in relation to the heat resistant outer panel to provide safe installation while conserving room space; and providing active dispursement of the heated room air from near the ceiling in proximity to the heating device, through the vertically aligned fluid passages to exhaust the heated air back into the room, near the floor, where it is needed for occupant comfort.

4,440,343

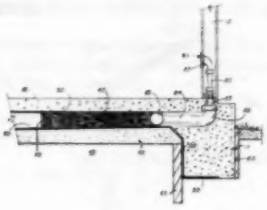
AIR CIRCULATION SYSTEM AND AIR FLOW ELEMENTS THEREFOR

Hervin J. Bergeron, Jr., Opelousas, La., assignor to Stephen J. Ledet, Jr., Opelousas and James Donald Elder, Sulphur, both of, La., part interest to each

Continuation-in-part of Ser. No. 135,073, Mar. 28, 1980, and Ser. No. 54,659, Jul. 3, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,375

Int. Cl.³ F24D *5/10*

U.S. Cl. 237—69 **15 Claims**



1. An air circulation system for generally enclosed structures such as homes comprising:

(a) an enclosed structure having at least a floor and enclosing walls and roof forming within an interior living area;

(b) a void air space subsurface to said floor;

(c) blower means connecting said living area and said void air space for moving air from said living area to said void air space;

(d) return line means for returning air from said void space to said living space;

(e) structural means in said void air space and communicating with said floor for facilitating heat exchange between said floor and said void air space and between said void air space and the ground therebelow, said structural means comprising at least in part a plurality of interfacing self-contained elements containing particulate expanded clay aggregate and means adjacent said elements for biasing air flow through said interfacing elements, said blower means and said return line means communicating with said interfacing elements for air flow transfer therewith.

4,440,344

FUEL INJECTOR

Barrie J. Martin, Shenfield, England, assignor to Eaton Corporation, Cleveland, Ohio

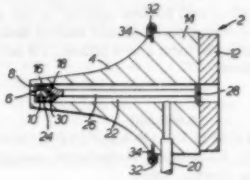
Continuation of Ser. No. 179,536, Aug. 19, 1980, abandoned. This application Jul. 21, 1982, Ser. No. 400,352

Claims priority, application United Kingdom, Sep. 11, 1979, 7931506

Int. Cl.³ B05B *1/08*

U.S. Cl. 239—102 **12 Claims**

1. An injector for injecting fuel for an engine, which injector comprises a nozzle, a fuel injection orifice in a transverse face of the nozzle, a fuel passage formed in said nozzle communicating with said fuel injection orifice, valve obturator means for closing the orifice, vibratory means for vibrating the nozzle to cause the valve obturator means to move away from the orifice to allow fuel to be injected, and a housing for the valve obturator means, the housing: (A) being fixed in position and secured to the nozzle at the end remote from the orifice (B) having an open downstream end with an opening formed therein, and (c)



being positioned adjacent the orifice but with said downstream end spaced apart from the transverse face of the nozzle.

4,440,345

SPRINKLER

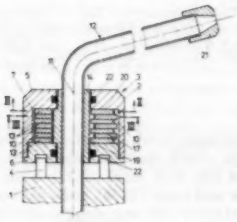
Eduard Figwer, Vienna, and Franz Schmitzberger, St. Pölten, both of Austria, assignors to Oesterreichische Salen-Kunststoffwerk Gesellschaft m.b.H., Kaiserstrasse, Austria

Filed Aug. 19, 1980, Ser. No. 179,483

Claims priority, application Austria, Aug. 30, 1979, 5790/79

Int. Cl.³ B05B *3/02*

U.S. Cl. 239—214 **12 Claims**



1. A sprinkler comprising:

a spray pipe having at least one outlet nozzle, said spray pipe being rotatable about an axis in response to the discharge of water from said at least one nozzle;

a stationary bearing member supporting said spray pipe for rotation of said spray pipe;

a stationary housing surrounding a portion of said spray pipe in a fluid tight manner so as to define a cavity;

at least two spaced first radial extensions in said cavity and fixed to said spray pipe; and

high viscosity fluid at least partially filling said cavity wherein said housing, said at least two radial extensions and said high viscosity fluid together comprise a braking means spaced from said bearing member, wherein said radial extensions are formed of oil resisting plastic materials.

4,440,346

AXIALLY TRANSLATABLE VARIABLE AREA CONVERGENT/DIVERGENT NOZZLE

Walter H. Wiley, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,490

Int. Cl.³ B64C *15/06*

U.S. Cl. 239—265.39 **7 Claims**

1. A variable area C/D nozzle assembly for a gas turbine engine comprising:

engine fixed structure;

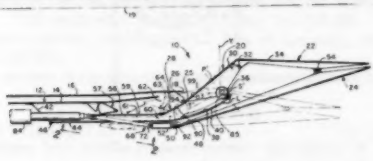
unison ring means supported from said fixed structure and being axially translatable;

at least one actuator adapted to engage and axially translate said unison ring means;

a plurality of upstream flaps circumferentially disposed about the engine axis defining a convergent nozzle, each of said upstream flaps having a forward end and a rearward end, said forward end of each flap being pivotally connected to said unison ring means for translation therewith and to permit rotation of said flaps to allow varying the exit area of said convergent nozzle;

cam track and cam follower means associated with said upstream flaps and adapted to decrease the exit area of said convergent nozzle as said forward ends translate downstream and increase the exit area of said convergent nozzle as said forward ends translate upstream;

a plurality of downstream flaps circumferentially disposed about the engine axis and defining a divergent nozzle, each downstream flap having a forward end and a downstream



end, said forward ends of said downstream flaps being pivotally connected to said rearward ends of said upstream flaps; and

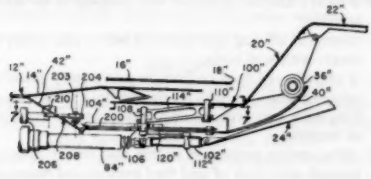
a plurality of external flaps circumferentially disposed about the engine axis radially outwardly of said downstream flaps and defining an external nozzle contour, said external flaps each having a forward end pivotally connected to said unison ring means for translation therewith, said downstream flaps and said external flaps being pivotally connected to each other downstream of their respective forward ends, wherein said unison ring means comprises a radially inner unison ring and a radially outer unison ring, said upstream flaps being pivotally connected to said inner unison ring and said external flaps being pivotally connected to said outer unison ring, said unison ring means including interconnection means interconnecting said inner and outer unison rings such that translation of either unison ring results in translation of the other unison ring.

4,440,347

SIMPLIFIED MEANS FOR BALANCING THE LOADS ON A VARIABLE AREA NOZZLE

William M. Madden, Palm Springs, and Walter H. Wiley, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,494
Int. Cl.³ B64C 15/06
U.S. Cl. 239—265.39 **9 Claims**



1. A variable area nozzle assembly for a gas turbine engine comprising:

engine fixed structure;

unison ring means supported from said fixed structure and being axially transiatable and including a first unison ring;

at least one actuator adapted to engage and axially translate said unison ring means;

a plurality of upstream flaps circumferentially disposed about the engine axis defining a convergent nozzle, each of said upstream flaps having a forward end and a rearward end, said forward end of each flap being pivotally connected to said first unison ring for translation therewith;

cam track means supported by said fixed structure, said cam track means including a cam track associated with each of said upstream flaps and disposed radially outwardly thereof, each of said upstream flaps including follower means adapted to rest on the track associated therewith and to follow said track as said unison ring means translates, said track being shaped to cause rotation of said flaps as said unison ring means translates;

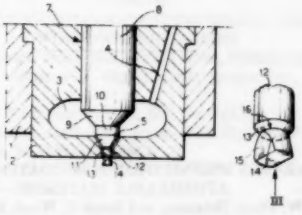
wherein said unison ring means includes balance means having a forwardly facing annular balance surface, said balance means being fixed relative to said first unison ring, said balance surface being subjected to a net pressure load having a component in the downstream direction which reduces the force which said actuator must exert to hold said flaps in a fixed position and to move said first unison ring.

4,440,348

FUEL INJECTION DEVICE FOR DIESEL ENGINES WITH PRECOMBUSTION CHAMBERS

Antonio Burgio di Aragona, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Aug. 20, 1981, Ser. No. 294,643
Claims priority, application Italy, Sep. 2, 1980, 68357 A/80
Int. Cl.³ B05B 1/26
U.S. Cl. 239—533.12 **10 Claims**

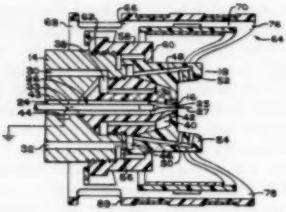


1. Fuel injection device for diesel engines with precombustion chambers, including an atomizer nozzle body (2) having a fuel supply duct (4) and an outlet opening (6), a needle (7) mounted for axial sliding movement in the atomizer nozzle body (2) and having a guide portion (8), an intermediate portion (9,10,11) which acts as a valve shutter member for controlling the fuel flow from the supply duct (4) to the outlet opening (6) in dependence on the pressure of the fuel in the supply duct (4), and a terminal portion (12,13,14) which extends through the outlet opening (6) and includes a cylindrical part (12), a frusto-conical part (13) tapering in the direction of the fuel outflow, and an end part (14) shaped so as to impart the desired form to the jet of fuel issuing from the outlet opening (6) in use, characterised in that the side surface of the end part (14) of the needle (7) has at least two flat faces (15) disposed on opposite sides of said end part, each of which lies in a plane tangential to the circumference defining the periphery of the smaller end (16) of the tapering frusto-conical part (13).

4,440,349
ELECTROSTATIC SPRAY GUN HAVING INCREASED SURFACE AREA FROM WHICH FLUID PARTICLES CAN BE FORMED

James E. Sickles, Glenshaw, Pa., and Themistocles C. Anestos, Utica, Mich., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 17, 1979, Ser. No. 76,014
Int. Cl.³ B05B 5/02
U.S. Cl. 239—698 11 Claims



1. A spray gun having a gas nozzle and a fluid nozzle, each of said nozzles being in cooperative spatial relationship with the other to cause a fluid stream issuing from the fluid nozzle to be atomized and sprayed as fluid particles by gas issuing from the gas nozzle, with said spray gun having disposed within the fluid stream means for increasing surface area from which said particles can be formed, said means being electrically grounded at least during fluid issue from the fluid nozzle, and with said spray gun additionally having induction charging electrode means disposed adjacent the gas and fluid nozzles, said electrode means (a) having a rear edge located rearward of a plane which is perpendicular to the axis of liquid flow and which passes through the discharge point of said fluid nozzle and (b) defining a charging zone wherein an electrostatic charge is imparted to atomized electrically chargeable fluid particles.

4,440,350
APPARATUS AND METHOD FOR COATING WITH AN ATOMIZABLE MATERIAL

Peter W. Dietz, Delanson, and Ralph T. Wood, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 3, 1982, Ser. No. 345,508
Int. Cl.³ B05B 5/04
U.S. Cl. 239—703 9 Claims

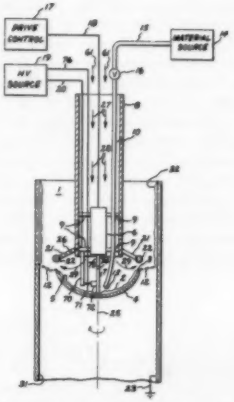
1. An apparatus for applying a coating of an atomizable material to the inside surface of an elongate glass tube comprising:

a rotatable member having a surface for receiving said material, said surface rotating together with said member;

means for rotating said member, said means being disposed adjacent to said rotatable member;

material delivery means for delivering said material to said surface of said member, said material delivering means being situated along the same direction as the extension of the axis of rotation through said surface of said member; and

non-rotatable, hollow tubular support means for insertion into said glass tube, said support means having said rotating means affixed thereto at an end thereof, said support means having an opening in the end of said support means

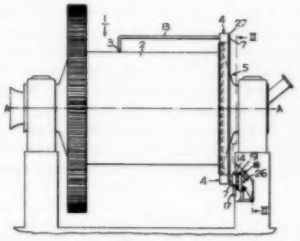


to which said rotating means is affixed, said opening facing said receiving surface.

4,440,351
APPARATUS FOR DELIVERING FLUID TO A ROTATING BODY

Carl F. Novotny, Greenfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 21, 1981, Ser. No. 333,171
Int. Cl.³ B02C 23/40
U.S. Cl. 241—41 9 Claims



1. An apparatus for delivering fluid from a stationary source to a rotary body, such as a mill for treating particulate material with a fluid, said body having a generally horizontal axis of rotation and said body having support means and rotation means, improvement comprising:

a. a rotary annular manifold box concentric to said axis of rotation;

b. means for affixing said manifold box to said rotary body to rotate with said body;

c. a plurality of feed orifices in said rotary manifold box opening along an orifice axis parallel to said axis of rotation; each said orifice being a like distance from said axis of rotation;

d. valve means positioned within said rotary manifold box aligned with each of said feed orifices and biased to close said orifices;

e. conduit means for transmitting fluid from said manifold to said rotary body;

f. a stationary fluid supply manifold having a fluid feed face positioned adjacent to and engaging a portion of the rotary manifold through which a minority of the orifices

open; said feed face containing a cavity communicating with the minority of feed orifices in the rotary manifold as said orifices rotate past the stationary manifold; and,

g. conduit means for transporting pressurized fluid from a fluid source to said cavity within the stationary manifold whereby said fluid is transmitted from the cavity of said rotary manifold box to apply pressure against the bias of the valves aligned therewith thereby opening such valves and discharge fluid through said orifices to the conduit means for transmitting fluid to said rotary body.

4,440,352

MACHINE FOR THE COMMINUTING OF BULK MATERIAL

Kurt Rössler, Belm, Fed. Rep. of Germany, assignor to Osnabrücker Metallwerke J. Kampschulte GmbH & Co. KG, Osnabrück, Fed. Rep. of Germany

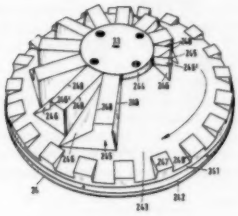
Division of Ser. No. 167,287, Jul. 9, 1980, Pat. No. 4,387,858. This application Jan. 26, 1983, Ser. No. 461,083

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928471

The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.

Int. Cl.³ B02C *18/12*

U.S. Cl. 241—152 A **23 Claims**



1. In a comminution apparatus, the combination comprising a housing for receiving material to be comminuted, a stator mounted in said housing, said stator having stator cutting edge means, a rotor rotatably mounted in said housing for rotation about a vertical axis, said rotor having rotor cutting edge means, said stator cutting edge means and said rotor cutting edge means each having a plurality of cutting edges which cooperate during rotation of said rotor to effect comminution of said material, said cutting edges each having an outer terminating end and an inner terminating end, at least one of said cutting edge means having the cutting edges thereof disposed in a common plane which is perpendicular to said vertical axis, said cutting edges disposed in said common plane having at least one of their terminating ends disposed along a spiral path, whereby the cutting edges having their at least one terminating ends disposed along a spiral path have cutting edge sections progressively radially displaced considered in the direction of rotation of said rotor such that the material being comminuted is engaged at progressively radially displaced locations by said progressively radially displaced cutting edge sections.

4,440,353

TEXTILE MACHINE ARRANGEMENT

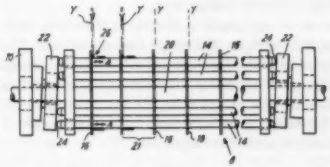
William E. A. Shelton, Oadby, and David C. Corby, Cosby, both of England, assignors to Alan Shelton Limited, Croft, England

Filed Nov. 16, 1981, Ser. No. 321,775

Claims priority, application United Kingdom, Nov. 19, 1980, 8037020

Int. Cl.³ B65H *51/22*

U.S. Cl. 242—47.01 **5 Claims**

1. A textile machine arrangement comprising a textile machine having a multiplicity of feed stations, a multiplicity of yarn sources for supplying yarn for each feed station on said machine, said yarn sources being located adjacent to said machine, and a yarn feed mechanism for drawing yarns from said sources and feeding them at a desired rate and tension along a path towards the appropriate ones of said feed stations, said machine arrangement being characterized in that said yarn sources are located in at least one group arranged to one side of said machine, and that said yarn feed mechanism includes a rotatable elongate roller device having a plurality of cylindrical path-defining surface portions each rotatable simultaneously and co-axially with a neighboring surface portion whereby each yarn is fed to one only of said surface portions and the yarn path of each yarn includes a region in which the yarn partakes of travel in a helical manner about a respective cylindrical surface portion of said roller device, said elongate roller device having a plurality of parallel disposed rods arranged in an annular formation, a plurality of plates arranged at intervals along the rods and each being provided with a plurality of apertures through each of which is slidingly received one of said rods, the portions of said rods between adjacent ones of said plates defining said surface portions, said plates being fixedly mounted upon a centrally disposed shaft and extending at least substantially radially thereof with end portions of said shaft flanking said plates, a stationary end plate having an oblique surface, and said rods being mounted for rotation with respect to said oblique surface of said stationary end plate and having oblique end surfaces which impinge against said oblique surface of said stationary end plate whereby rotation of said shaft causes lengthwise movement of said rods with respect to said apertured plates.

4,440,354

AUTOMATIC TENSION-ADJUSTING MECHANISM FOR WINDOW REGULATORS

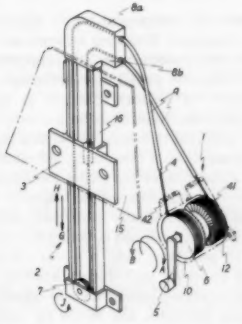
Tetuo Kobayashi, Ikeda, and Syoichi Hirai, Nishinomiya, both of Japan, assignors to Nippon Cable System Inc., Hyogo, Japan

Filed Nov. 9, 1981, Ser. No. 319,717

Claims priority, application Japan, Jun. 22, 1981, 56-96985; Jul. 27, 1981, 56-112093[U]

Int. Cl.³ E05F *11/48, 5/12*; B65H *75/00*

U.S. Cl. 242—54 R **4 Claims**



3. An automatic tension-adjusting mechanism for a window regulator comprising:

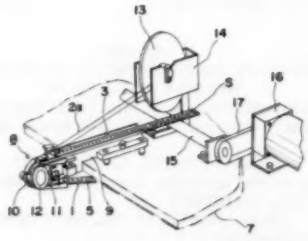
a wire arranged in a loop and having two ends;
a shaft mounted for rotation;
a first pulley secured on said shaft for rotation therewith and having one end of said wire affixed thereto;
a second pulley supported on said shaft for rotational and axial movement with respect thereto and having the other end of said wire affixed thereto;
said first and second pulleys each being formed with a plurality of ratchet teeth on their adjacent sides adapted to mesh with each other;
spring means frictionally engaging said second pulley and arranged to urge said second pulley axially on said shaft toward said first pulley to cause meshing of said ratchet teeth, whereby rotation of said shaft in one direction will cause said second pulley to rotation in said one direction with said first pulley; and
rotation of said shaft in the other direction will cause said ratchet teeth to disengage and allow said first pulley to rotate in said other direction while said second pulley is retained frictionally by said spring means and thereby takes up any excess elongation existing in said wire loop, whereafter said wire will cause said second pulley to rotate in said other direction.

4,440,355

ELECTRONIC COMPONENT SUPPLY APPARATUS

Kazuhiro Mori; Yoshihiko Misawa, both of Katano; Eiji Itemadani, Sakai, and Akira Kabeshita, Miriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1982, Ser. No. 351,466
Claims priority, application Japan, Feb. 23, 1981, 56-25871
Int. Cl.³ B65H *75/02*
U.S. Cl. 242—55 **8 Claims**



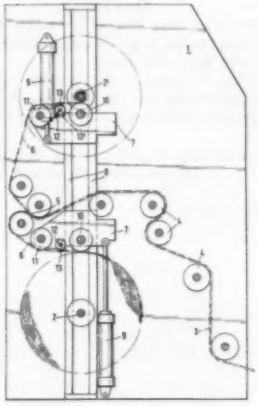
1. An electronic component supply apparatus for use in an electronic component mounting arrangement, which employs an electronic component collective support in the form of an electronic component carrier tape including a tape base formed with a plurality of recesses arranged at equal intervals for accommodating electronic components therein, and a covering tape fixedly adhering to one surface of said tape base for covering said recesses of said tape base, said electronic component supply apparatus comprising means for intermittently feeding said electronic component carrier tape by a predetermined pitch, means for horizontally supporting said electronic component carrier tape, with said covering tape positioned upward in respect to said tape base, a cover member arranged to contact said covering tape during winding thereof so as to separate said covering tape from said tape base and having a predetermined thickness, and means for winding up, under a predetermined tension, of said covering tape at a speed lower than the speed for intermittently feeding said tape base of said electronic component carrier tape.

4,440,356

MACHINE FOR SEPARATING AND SLITTING THIN SHEET

John C. Lang, Nashville, Tenn., assignor to Erwin Kampf GmbH & Co., Wiehl, Fed. Rep. of Germany

Filed Jul. 23, 1981, Ser. No. 285,987
Int. Cl.³ B65H *35/02*
U.S. Cl. 242—56.5 **4 Claims**



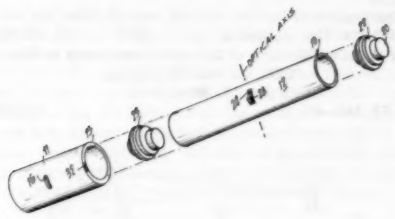
1. In a machine for processing a web of thin sheet, especially thin aluminum sheet or aluminum foil, which includes at least one driven winding shaft journalled in a stationary support structure of the machine and guide and deflecting rolls which lead the sheet toward a winding point at which the sheet is wound onto the winding shaft; in said machine, a device for longitudinally slitting the sheet into a plurality of sheet strips which are being wound onto the winding shaft in the form of longitudinally abutting strip coils, the device comprising in combination:
a winding carriage guided for displacement towards and away from the winding shaft;
a pressure roll journalled on the winding carriage so as to contact the strip coils at the winding point;
means for biasing the winding carriage towards the winding shaft so that the pressure roll exerts a radial winding pressure at the winding point, while progressively displacing the winding carriage away from the winding shaft, in response to the increase in diameter of the strip coils;
a sheet deflecting roll likewise journalled on the winding carriage, at a short distance from the pressure roll and ahead of the latter in the sense of sheet movement, the location of the deflecting roll being such that it deflects the sheet path in all positions of the winding carriage, thereby creating a terminal sheet run between the deflecting roll and the pressure roll which remains in an unchanging relationship relative to the winding carriage in all carriage positions; and
a plurality of transversely spaced slitting knives arranged on the winding carriage in a position in which the knives reach into the path of the terminal sheet run, just ahead of the winding point.

4,440,357

MANDREL AND CORE ASSEMBLY FOR LARGE FORMAT CAMERAS

Quentin D. Vaughan, Hollywood, Fla., assignor to Visual Graphics Corporation, Tamarac, Fla.

Filed Jul. 15, 1982, Ser. No. 398,686
Int. Cl.³ B65H 75/02
U.S. Cl. 242—68.5 6 Claims



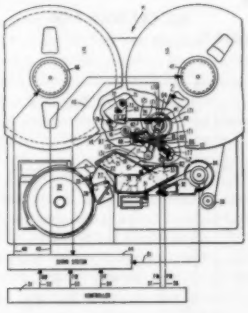
1. A mandrel and core assembly for supporting rolls of photosensitive material within a camera comprising an elongated, cylindrical mandrel, means at each end of said mandrel to rotatably secure it within the camera, a first slot in the mandrel located between the ends of the mandrel, normal to the longitudinal axis of the mandrel, and upon the longitudinal optical axis of the image plane of the camera, a detent yieldably carried by the mandrel within the first slot extending through the said slot and beyond the outer surface of the mandrel, an elongated, hollow core, said core having a cylindrical core body adopted to carry a roll of photosensitive material thereon and slidably receivable upon the mandrel, and a second slot in the core body midway between the ends thereof of a size to receive the detent therein to couple the core and mandrel together.

4,440,358

TAPE TENSIONING APPARATUS AND METHOD OF ASSEMBLY

Dennis M. Ryan, San Mateo, and Robert Hursey, Los Altos, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Sep. 2, 1982, Ser. No. 414,234
Int. Cl.³ B65H 59/38, 63/02; G03B 1/04; G11B 15/32
U.S. Cl. 242—189 7 Claims



4. Field-replaceable tension-sensing apparatus for a tape transport, comprising:

a housing adapted for detachable attachment to said transport on said tape path thereon and between a pair of tape-engaging and path-determining means for said tape;

a tape-engaging tension arm mounted for pivoting motion on a shaft in said housing and extending from said housing for engaging said tape between said path-determining means and for inducing said loop in said tape with the length of said loop varying with said tension of said tape in said loop, said loop-inducing means being arranged for motion in accordance with the varying length of said loop as an indication of said tape tension;

a first circuit board attached to and moving with said shaft for carrying electronic elements, and a space-traversing-signal generating means mounted on said circuit board in predetermined indexed relation with said arm;

means for receiving and transducing said space-traversing signal mounted on a second circuit board fixedly attached to said housing in predetermined spaced relation to said generating means; in predeterminded indexed relation to said housing and being adapted to produce a tension-representing signal as an indication of the degree to which said signal generating means departs from a predetermined indexed relation with said housing;

said signal generating means including a light emitting diode and a grating lens for focussing said light into a substantially radially linear zone upon said receiving and transducing means;

said receiving and transducing means being a photo-potentiometer element of toroidal shape mounted coaxially with said shaft and adapted to produce said tension signal as a indication of the rotational position of said light zone with respect to said housing;

said housing being adapted for attachment to said transport in predetermined indexed relation therewith; and

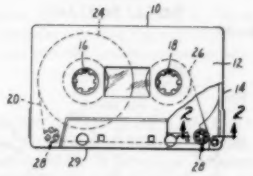
whereby the tension signal always represents the rotational position of said arm with respect to said housing, and, when said housing is mounted on said transport, the position of said arm with respect to said transport as well; and whereby said apparatus may be attached to said transport without the need for subsequent calibration.

4,440,359

CASSETTE ROLLER GUIDE

Norman E. Nelson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 22, 1982, Ser. No. 360,348
Int. Cl.³ G03B 1/04; G11B 15/32
U.S. Cl. 242—199 7 Claims



1. In a tape cassette including a pair of generally parallel sidewalls having spaced inner surfaces, the combination with said sidewalls of a roller guide assembly comprising:

a roller guide having an axis disposed generally normal to said inner surfaces, axially spaced bearing surfaces adjacent said inner surfaces, a main portion comprising a generally cylindrical outer surface about said axis, and at least one axially extending projection integrally formed with said main portion and defined by a partial radially extending cut between said projection and said main portion, said projection defining one of said bearing surfaces and being resiliently deflected toward said main portion by the spacing between the inner surfaces of said sidewalls to locate said roller guide with respect to said inner surfaces; and

means mounting the guide between said sidewalls for rotation relative thereto around said axis.

4,440,360

EXTENDABLE FIN

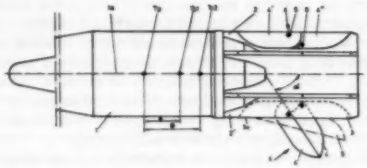
Stig Hallström, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Continuation of Ser. No. 195,165, Oct. 8, 1980, abandoned. This application Jan. 19, 1983, Ser. No. 459,163

Claims priority, application Sweden, Oct. 9, 1979, 7908358

Int. Cl.³ F42B *13/32*

U.S. Cl. 244—3.28 **10 Claims**



1. In a fin stabilized ammunition unit including a projectile for firing into a trajectory, an improved stabilizing apparatus comprising:

a projectile housing having a fin carrying longitudinal groove;

first and second longitudinally extending planar fin parts, disposed within said groove, which have abutting ends, each mounted for rotation in a common plane containing a longitudinal axis of the projectile on separate pivot points adjacent said abutting ends in said groove, remaining free ends of said fin parts extending in opposite directions from said pivot points, said fin parts having complementary surface portions which abut to form a single fin upon pivoting of said fin parts away from said groove in response to rotational acceleration of said projectile which forces said fin parts from said groove.

4,440,361

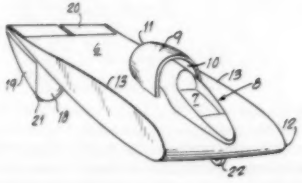
AIRCRAFT STRUCTURE

Rodney McGann, 4187 Old San Jose Rd., Santa Cruz, Calif. 95065

Continuation-in-part of Ser. No. 208,069, Nov. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 54,817, Jul. 5, 1979, abandoned. This application Sep. 27, 1982, Ser. No. 423,639

Int. Cl.³ B64C *1/00*

U.S. Cl. 244—36 **7 Claims**



1. An aircraft structure comprising a substantially rectangular airfoil having an aspect ratio within the range of 0.35 to 1 comprising a leading edge, a trailing edge, and substantially rectangular tips free from obstructions to air flow around the tips adjacent the leading edge, a duct mounted on the upper surface of the airfoil having an air inlet port on the upper surface only of said airfoil and spaced not more than one third the chord of said airfoil from said tips and within the range of about 25 to 40 percent of said chord from the leading edge of said airfoil and said duct being spaced a substantial distance from the trailing edge of said airfoil, and means for inducing airflow from said leading edge and from said tips into and through said air inlet port and duct at a velocity greater than the velocity of flow of air over the leading edge of the airfoil thereby substantially eliminating vortices at the tips of the airfoil, and a downwardly extending fin and rudder at each tip of the airfoil on the lower surface thereof near the trailing edge of said airfoil.

4,440,362

TWO-AXIS RUDDER TRIM FOR AIRCRAFT

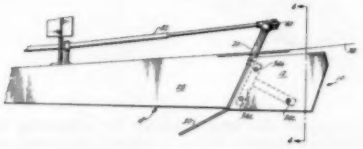
Robert A. Walker, 17130 Roscoe Blvd., Los Angeles, Calif. 91325

Continuation of Ser. No. 169,405, Jul. 16, 1980, Pat. No. 4,373,689. This application Sep. 29, 1982, Ser. No. 427,566

The portion of the term of this patent subsequent to Feb. 15, 1990, has been disclaimed.

Int. Cl.³ B64C *5/10*

U.S. Cl. 244—87 **12 Claims**



1. A two axis trim element for aircraft comprising:

a rotatable shaft with a longitudinal axis;

a substantially vertical surface coupled to the shaft, said surface having a lower edge;

a horizontal surface having a leading edge and being attached to the lower edge of the vertical surface along a first side edge of the horizontal surface;

a downwardly-canted tab extending from the leading edge of the horizontal surface;

an upwardly-canted tab extending from a second side edge of the horizontal surface opposite the vertical surface; and

means to controllably rotate the shaft about the longitudinal axis to allow orientation of the trim element in different rotatable positions.

4,440,363

LANDING MAT OR THE LIKE

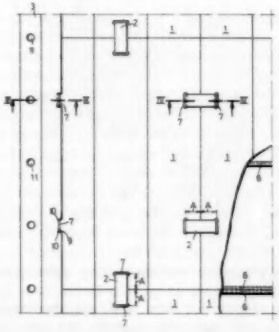
Werner Brand, Hagen, Fed. Rep. of Germany, assignor to Estel Hoesch Werke AG, Dortmund, Fed. Rep. of Germany

Filed Oct. 1, 1981, Ser. No. 307,592

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1980, 3037809

Int. Cl.³ B64F *1/00*

U.S. Cl. 244—114 R **4 Claims**



1. A load-supporting platform adapted to rest on precompacted terrain, comprising a multiplicity of multiply adjoining

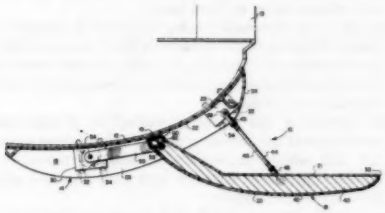
substantially identical units having opposite longitudinal edges continuous with corresponding edges of other units and transverse edges contiguous with corresponding edges of other units, each of said units having a pair of downwardly turned flanges along their opposite longitudinal edges and inner ribs parallel to but spaced from said flanges and formed as flattened corrugations, a transverse rib for at least one of said units extending at an angle to said inner ribs and flanges thereof, each of said units being formed at a predetermined distance inwardly of at least one of its edges with a window opposite a window formed in an adjoining unit along the contiguous edge thereof, and clips spanning contiguous edges of adjoining units and removably received in the windows thereof, said windows being elongated and having a major axis parallel to the respective edge of the unit formed with the window, said clip being a metal strip formed with a hook at one end engageable in one window and, at the other end, with a downwardly turned tongue provided with a corrugation engageable beneath an edge of another of said windows receiving said tongue.

4,440,364

RETRACTABLE AIRCRAFT STEP

Steven S. Cone, 13611 Heartside Pl., Dallas, Tex. 75234; David E. Jones, 747 Vinecrest, Richardson, Tex. 75080, and Richard C. Serkland, Rte. 5, Box 93, McKinney, Tex. 75069

Filed Sep. 8, 1981, Ser. No. 300,259
Int. Cl.³ B64C *1/24*
U.S. Cl. 244—129.6 **18 Claims**



1. A retractable aircraft step for attachment to an airframe, said step comprising:

a support member;

a step member connected to said support member and movable between a retracted position and an extended position wherein said step member extends generally under and adjacent to a doorway in said airframe;

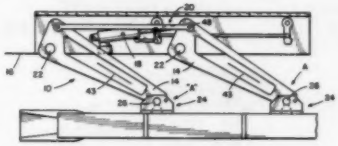
linkage means interconnecting said step member and said support member for moving said step member between said positions, said linkage means including first link means pivotally connected to said support member and said step member, second link means pivotally connected to said support member at a point spaced from said pivotal connection of said first link means to said support member, said second link means being pivotally connected to said step member at a point spaced from the pivotal connection of said first link means to said step member, and a beam mounted on said step member and including opposed end portions forming pivotal connections between respective ones of a pair of links comprising one of said first and second link means and said step member, said end portions being elastically deflectable at an interference point in the path of movement of said linkage means to allow said step member to be moved between said extended and retracted positions.

4,440,365

LAUNCH MECHANISM

John W. Holtrop, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 3, 1981, Ser. No. 326,872
Int. Cl.³ B64D *1/02*
U.S. Cl. 244—137 R **3 Claims**



1. A release mechanism for securing and releasing a store having a securing lug comprising:

a swing arm having length, a proximate end portion, a distal end portion, and pivotingly movable at the proximate end with respect to the vehicle between a store storage position and a store launch position, and

means for securing and releasing the store disposed at the distal end portion, said means for securing and releasing comprising:

a hook for securingly engaging the securing lug, the hook being pivotable about a first pivot point disposed at the distal end portion and pivotably disengagable from the lug for release of the store,

a cam disposed in predetermined relationship to the store, the cam and the store being pivotably movable about a second pivot point with respect to the swing arm,

the hook being provided with a cam follower surface movingly engagable with the cam upon pivoting of the arm at the proximate end portion with respect to the vehicle, the cam being pivotable with respect to the swing arm about the second pivot point, and

a tang disposed along a portion of the cam follower surface and engagable with the cam upon pivoting of the swing arm into a predetermined position intermediate the storage position and the launch position, the hook being pivotable about the first pivot point upon engagement of the tang with the cam upon further travel of the cam past a predetermined position for moving the hook out of engagement with the securing lug upon further pivoting of the swing arm past the predetermined position.

4,440,366

PARACHUTE CONTROL APPARATUS

Arthur A. Keeler, Mt. Waverley; William M. Rice, Altona, and Edward C. Tremayne, North Coburg, all of Australia, assignors to Commonwealth of Australia, Canberra, Australia

Filed Nov. 3, 1981, Ser. No. 317,882
Claims priority, application Australia, Nov. 3, 1980, PE6289
Int. Cl.³ B64D *17/34*
U.S. Cl. 244—138 R **8 Claims**

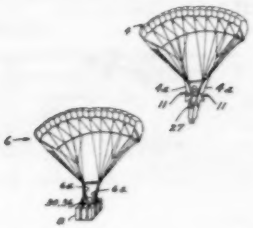
1. Parachute control apparatus for enabling control of the descent path of slave parachute from a manned and simultaneously descending parachute, the apparatus including:

hand operable master controlling means selectively operable by a parachutist, and comprising two hand held master controllers, one for each hand of the parachutist, the master controllers being arranged to be held together with the parachutist's control line toggles whereby the parachutist can selectively pull on his own control line to control his own parachute in direction and glide angle and can simultaneously selectively operate the master controllers,

a control signal transmitter adapted to be carried by the parachutist and responsive to operation of the two master

controllers to transmit respective control signals to the slave parachute,

a control signal receiver adapted to be carried by the slave parachute and operative to respond to the control signals received from the transmitter by generating appropriate drive signals, and



control line drive means adapted to be operatively associated with control lines of the slave parachute and responsive to the drive signals of the control signal receiver to operate the control lines of the slave parachute and control the descent path thereof.

4,440,367

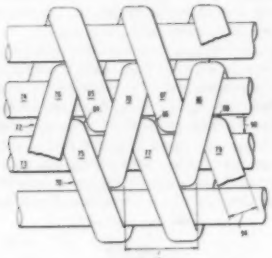
BARRIER-TYPE METAL WIRE FABRIC AND ITS MANUFACTURE

Ronald G. Daringer, Cambridge, Md., assignor to Maryland Wire Belts, Inc., Church Creek, Md.

Division of Ser. No. 227,666, Jan. 23, 1981, Pat. No. 4,396,041. This application Jun. 13, 1983, Ser. No. 503,413

Int. Cl.³ B21F *27/00*

U.S. Cl. 245—6 **11 Claims**



1. Barrier-type metal wire fabric comprising

a plurality of metal wire helically-wound spirals and connector rod means of predetermined gage and configuration assembled to establish a longitudinal direction for such fabric,

such spirals being formed from elongated metal wire having a predetermined transverse cross-sectional configuration with at least two diametrically opposed planar surfaces,

such spirals including left-hand wound spirals and right-hand wound spirals,

each such helically-wound spiral being elongated and having a centrally located winding axis with individual helical loops uniformly distributed along such winding axis,

such individual helical loops having a substantially elliptical configuration when projected onto a plane in transversely perpendicular relationship to such winding axis,

such elliptical configuration defining a major axis and a minor axis with the major axis being oriented in the longitudinal direction of assembled fabric,

an individual loop having an internal surface and external surface defining longitudinally leading and trailing bight end portions of its curvilinear configuration,

such bight end portions being connected by intermediate elongated leg portions disposed generally longitudinally in assembled fabric,

such internal loop configuration defining an enlarged centrally-located opening with spacing between such elongated leg portions being greater contiguous to such minor axis than contiguous to such bight ends,

such internal loop surface being defined by one of the at least two diametrically opposed planar surfaces of such helically-wound wire with such exterior loop surface being defined by the remaining planar surface of the two diametrically opposed surfaces of such helically-wound wire,

such connector rod means including a plurality of metal wire connector rods,

such connector rods being elongated and having a length dimension at least equal to the lateral dimension of metal wire fabric as assembled,

each such connector rod presenting a predetermined curvilinear cross-sectional exterior surface configuration,

the plurality of helically-wound spirals being disposed with their winding axes substantially parallel and extending in the lateral direction of assembled metal wire fabric and with internal loop portions of next adjacent pairs of helically-wound spirals overlapping in the longitudinal direction of assembled wire fabric,

such next adjacent pairs of overlapping spirals being oppositely wound such that left-hand spiral portions overlap with right-hand spiral portions,

such adjacent pairs of spirals being free of interlocking weaving of overlapping portions with at least a portion of the external loop bight end surface of one spiral being disposed within the internal loop of its next adjacent oppositely wound spiral at a location contiguous to the minor axis of such latter internal loop,

the connector rod means being disposed to extend in the lateral direction of the metal wire fabric as assembled with a connector rod extending laterally through overlapping portions of internal loop surfaces of next adjacent pairs of helically-wound spirals,

such connector rod means providing for pivotal relative movement of next adjacent pairs of spirals about a connector rod while substantially eliminating non-rotational relative movement between such next adjacent pairs of helically-wound spirals,

the helically-wound spirals and connector rod means as assembled establishing a metal wire fabric of extended surface area which is substantially free of open passages in a direction transverse of such surface area.

4,440,368

MOUNTING SYSTEM FOR PANEL MOUNTED DEVICES

Robert D. Kitchen, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 7, 1981, Ser. No. 261,359

Int. Cl.³ G12B *9/00*

U.S. Cl. 248—27.1 **12 Claims**

1. A quick mounting system for panel mounted devices comprising:

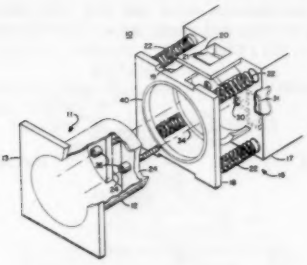
a base to be mounted on a panel;

a mounting flange cooperating with said base to provide for clamping the panel between said base and said mounting flange;

screw means captive in said mounting flange and having a threaded shank with a given major diameter extending from said mounting flange in a first direction toward said base along an axis transverse to the panel at the mounting location;

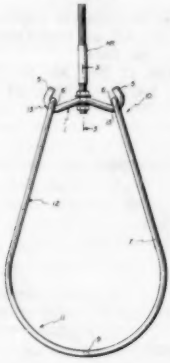
thread engagement means in said base having a deflectable member configured and biased to engage at least a portion of the threads of said screw means and a ramp surface cooperating with the deflectable member to permit deflec-

tion thereof away from the axis in response to a force in the first direction and to prevent deflection away from the



axis in response to a force in a direction opposite the first direction.

4,440,369
PIPE HANGER
James C. Banks, 1401 N. Shawano Dr., Marshfield, Wis. 54449
Filed Mar. 11, 1982, Ser. No. 357,139
Int. Cl.³ F16L 3/00
U.S. Cl. 248—62 **4 Claims**



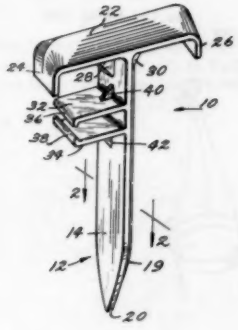
1. A pipe hanger or the like to be attached to a depending hanger rod comprising in combination:

a first member having outwardly extending hooked ends and fixed to the hanger rod,

a second member having a lower portion of arcuate shape and a top portion with means to removably attach to said hooked ends for rapid attachment to the hanger rod,

said arcuate lower portion supporting a pipe thereon in which said top portion of said second member is provided with substantially linear portions, said second member formed out of a spring, resilient material in which said second member is provided with first and second free ends, on said top portion, one said free end adapted to be initially looped over one of said hooked ends of said first member, a pipe to be supported draped thereon, and a second free end looped over a second said hooked end of said first member wherein said first member is formed from first and second rods, welded together along portions thereof, a central area provided with an opening for slidable insertion upon the hanger rod in which said joined portions of said first member curve outwardly and downwardly in which said hooked ends taper upwardly and inwardly toward the hanging rod, and a bight portion is provided at a transition between said joint areas and said hooked ends in which said free ends of said second member define loops, said loops communicating with and formed by first and second rods tapering downwardly and outwardly, rigidly constrained and separated at a lowermost portion by means of a third rod therebetween.

4,440,370
SECURING STAKE
Robert M. Rood, 7164 Victoria Rd., St. Paul, Minn. 55119
Filed Sep. 28, 1982, Ser. No. 426,143
Int. Cl.³ A62C 23/04
U.S. Cl. 248—75 **1 Claim**



1. A securing stake comprising:

an elongated blade portion formed of a stiffly resilient material;

said blade portion having first, second and third integrally formed surfaces, and said first surface being a relatively wide substantially flat surface, and said second and third surfaces being relatively narrow and disposed at an angle with said first surface such that said blade portion has a generally triangular cross section and is relatively thin at the edges thereof and thick in the middle, the width of said first, second and third surfaces varying such that said blade portion tapers to a point at one end, the thickness of the middle of said blade portion also tapering in the vicinity of said point;

a cross member portion, integrally formed with said blade portion, disposed at the end of said blade portion opposite said point, having a width in the plane of said blade portion first surface substantially equal to the width of said blade portion first surface, and extending substantially equal distances on either side of said blade portion in directions perpendicular to the plane of said blade portion first surface;

said cross member portion including at each end thereof downturned portions extending toward said blade portion point;

first and second transverse support braces, integrally formed between said cross member portion and said blade portion; and

first and second stiffly resilient projecting arms integrally formed with said blade portion, extending outwardly from said blade portion first surface, said arms being generally parallel to said cross member portion, and having a width in the plane of said blade portion first surface equal to the width of the blade portion first surface;

said first arm being disposed a first predetermined distance from said cross member and including at the end thereof a short downturned portion extending toward said blade portion point;

said second arm being disposed a second predetermined distance from said first arm and including a short upturned portion extending toward said cross member portion;

a third transverse support brace integrally formed between

the upper surface of said first arm and said blade portion first surface; and

a fourth transverse support brace integrally formed between the lower surface of said second arm and said blade portion first surface.

4,440,371

POT HANGER

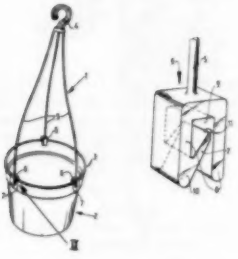
Dirk W. Wijsman, Rosmalen, Netherlands, assignor to Elho International B.V., Rosmalen, Netherlands

Filed Jun. 29, 1981, Ser. No. 278,098

Claims priority, application Netherlands, Aug. 28, 1980, 8004871

Int. Cl.³ A47H *1/10*

U.S. Cl. 248—318 **3 Claims**



1. A hanger assembly for use with pots of the type having a circular rim defined by a circumscribing top wall portion terminating in an enlarged lip overhanging said top wall portion, said assembly comprising a hanger portion having at least three flexible rod-like members depending therefrom and each having a carrying member connected thereto, each carrying member being of inverted generally U-shape to define a pair of spaced legs joined at their upper ends by a bridge piece and each leg being of greater length than of width so each pair of spaced legs is able to accomodate the circular rim therebetween with clearance, the opposed surfaces of said legs near said bridge piece being spaced apart by an amount greater than the thickness of said rim whereby to straddle such rim with said clearance, a tapered tongue angling upwardly from the lower end of one of said legs generally toward the juncture of the other leg and said bridge piece, said tongue terminating in a tip which is in spaced relation to such juncture and in spaced relation to said other leg such that said tip engages against said top wall portion in underlying relation to said lip and supports the pot by downward pressure of said lip on said tongue, said tongue being of a thickness less than that of said one leg and tapering toward said tip, each said carrying member being formed of resilient material whereby the weight of said pot preferentially deforms said tongue and especially the tip thereof to increase the pressure thereof against said top wall portion below said lip.

4,440,372

BELLOWS MOUNTING ARRANGEMENT FOR SWIVEL CHAIR

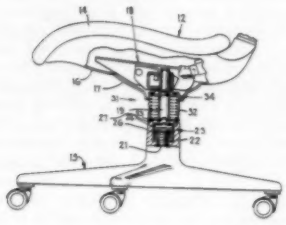
Joseph M. Wisniewski, Marne, Mich., assignor to Haworth, Inc., Holland, Mich.

Filed Mar. 18, 1981, Ser. No. 244,840

Int. Cl.³ F16M *11/00*

U.S. Cl. 248—406 **15 Claims**

1. In a chair having a seat means, a pedestal-type base, a spindle assembly vertically joining the base and the seat means for permitting rotation of the latter about an upright axis defined by the spindle assembly, and an elongated extendible and contractible tubular boot disposed between said base and seat means in surrounding relationship to said spindle assembly, said boot having its lower end anchored to said base, the improvement comprising retainer means coacting between said seat means and the upper end of said boot for axially securing said upper end to said seat means while permitting relative rotation therebetween about said axis, said retainer means including a bearing ring snugly and nonrotatably seated within



the upper end of said boot, and a retainer member fixed relative to said seat assembly and having an annular portion which is rotatably supported on said bearing ring, said bearing ring and said retainer member having means coacting therebetween for axially securing said bearing ring and said retainer member together.

4,440,373

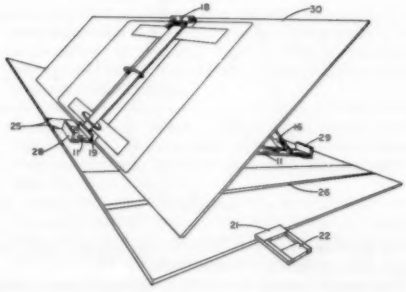
FOLIO AND NOTEBOOK DISPLAY STAND

Bruce Beitler, P.O. Box 935, and Irene Ostendorf, 1203 W. 35th, both of Kearney, Nebr. 68847

Filed Feb. 17, 1981, Ser. No. 234,952

Int. Cl.³ A47B *97/04*

U.S. Cl. 248—461 **8 Claims**



1. A notebook display stand and portfolio, comprising

a portfolio having two folding panels hingedly connected along a folding line therebetween,

a collapsible triangular frame for supporting a notebook at an inclined position,

a detachable frame mounting means on said portfolio for allowing detachment of said frame from said portfolio,

said frame comprising

an elongated base member operably attached to said portfolio by said detachable frame mounting means,

an elongated support member, for supporting a notebook, having one end hingedly connected to said base member and an opposite free end, and

an elongated brace member having one end hingedly connected to the free end of the support member and a lower end detachably connectable to the base member,

said base member being longer than said support member which is longer than said brace member,

said brace member being foldable into generally parallel alignment against said support member which is foldable

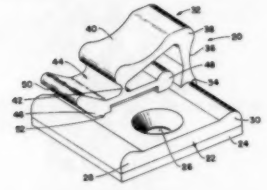
into generally parallel alignment against said base member upon collapsing of said frame.

4,440,374

INTEGRALLY FORMED RESILIENT CLIP AND EXTENSION

Jean R. Achille, Forest Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 21, 1981, Ser. No. 256,220
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—544 **17 Claims**



1. A resilient clip adapted for releasably accommodating at least one elongated article, such as tube or cable, wherein said clip includes a base, an integral resilient arm means attached to one side of the base adjacent one edge and having an end disposed in spaced overlying relation to said base, pressure means for positioning said at least one article relative to said base including a side facing said base and opposite outer margins extending generally transverse to the length of said resilient arm means, flexible integrally formed means attaching the pressure means to the end of the said resilient arm means, said flexible means disposed transverse to the length of said resilient arm means and intermediate said outer margins, said pressure means normally positioned adjacent the base and laterally yieldable away from said base along with the end of said resilient arm means to permit insertion, between the base and the pressure means, of an article to be supported, said pressure means including rib means on said side facing said base.

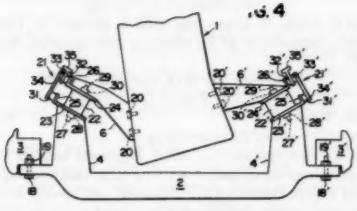
4,440,375

ENGINE MOUNTING STRUCTURE FOR AUTOMOTIVE VEHICLE

Masao Fukushima, Fuchu, and Komei Yazaki, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 7, 1981, Ser. No. 251,855
Claims priority, application Japan, Apr. 17, 1980, 55-51350
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—559 **4 Claims**

Fig. 4



1. An engine mounting structure for mounting an automotive engine on the body structure of an automotive vehicle, comprising at least one shock and vibration insulating unit which comprises:

a first coupling member to be connected to the body structure of the vehicle;

a second coupling member to be connected to the body structure of the engine and spaced apart from the first coupling member;

a main resilient block intervening directly between the first and second coupling members; and

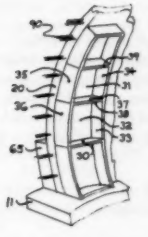
vibration cancelling means comprising at least one combination of a first mass member, a second mass member, a first auxiliary resilient block intervening directly between said first coupling member and said first mass member, a second auxiliary resilient block directly intervening between said second coupling member and said second mass member, and a third auxiliary resilient block directly intervening between the first and second mass members.

4,440,376

EARTH SHELTERED BUILDING TECHNOLOGY

Richard E. Peterson, 412 Pierce Ave., #3, St. Paul, Minn. 55104

Filed Sep. 9, 1980, Ser. No. 185,560
Int. Cl.³ E04G *11/06*
U.S. Cl. 249—18 **10 Claims**



1. A reusable construction form system for assembly and disassembly relative to a preformed foundation surface at a building site, said form system for producing ellipsoidal cavities to receive building material in the construction of a generally curvilinear thin shelled building structure for an earth sheltered building onto the preformed foundation surface, said form system being disposed to produce ellipsoidal cavities having a vertical cross section of an elliptical configuration with an eccentricity value ranging essentially from 0.50 to 0.95, said form system comprising:

(a) an inner form network of a plurality of differing, predetermined inner form panels, said inner form panels varying in configuration and being placable at predetermined locations in said inner form network as determined by the location relative to the preformed foundation surface, said inner form network having an outward facing non-cohesive convex surface which extends generally upward from a generally inner edge of said foundation surface, said outward facing surface of said inner form network further having a vertical cross section of an elliptical configuration having an eccentricity value which ranges essentially from 0.50 to 0.95 to form an inner ellipsoidal structure, and,

(b) an outer form network comprising a plurality of detachably mountable strata of predetermined outer form panels, said outer form network having a generally continuous, non-cohesive concave surface running generally spacially parallel to said convex surface of said inner form network to form an outer ellipsoidal structure.

4,440,377

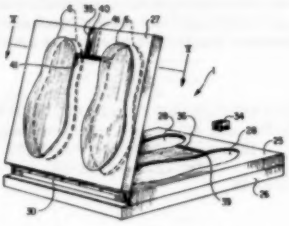
MOLD FOR FOOTWEAR SOLE

Ladislav Hujik, Batawa, Ontario, Canada K0K 1E0

Filed Sep. 22, 1982, Ser. No. 421,425
Claims priority, application Canada, May 5, 1982, 402309
Int. Cl.³ B29C *1/00*
U.S. Cl. 249—119 **3 Claims**

1. A mold for molding a plurality of footwear soles compris-

ing a bottom mold; an intermediate mold; hinge means pivotally connecting said intermediate mold to said bottom mold, whereby said intermediate mold can be rotated between an open position and a closed position on said bottom mold for defining at least one first mold cavity with said bottom mold; a vertically movable top mold for closing on said intermediate mold to define at least one second mold cavity with said intermediate mold; and an injection port in said intermediate mold for introducing moldable plastic material into said first and second cavities for forming said soles on said intermediate mold, whereby, when the mold is opened by moving said top mold away from said intermediate mold, the intermediate mold can be rotated to the open position for discharging the molded soles.



4,440,378

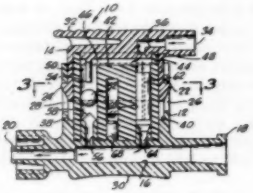
FLOW CONTROL APPARATUS

Michael P. Sullivan, P.O. Box 175, Wasco, Oreg. 97065

Filed Oct. 16, 1981, Ser. No. 312,856

Int. Cl.³ F16K *7/02, 51/00;* **A61M** *5/00*

U.S. Cl. 251—117 **12 Claims**



1. A flow control apparatus comprising

a housing having a hollow body and a plunger slidably positioned in and extending from said hollow body, said housing including a central cavity defined by said hollow body and said plunger, an inlet into said central cavity and an outlet from said central cavity;

a block of resilient material positioned in said central cavity between said inlet and said outlet and having a first passage therethrough oriented to provide communication between said inlet and said outlet and a second passage therethrough oriented to provide communication between said inlet and said outlet, said second passage including a rigid flow restrictor therein; and

a valve in said passage.

4,440,379

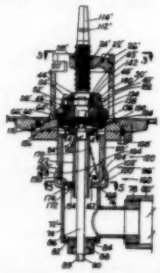
BOTTOM OPERATOR FOR TOP OPERATED BOTTOM INSTALLED TANK CAR VALVE ASSEMBLY

Gunter R. Behle, St. Peters, and David P. Hillstead, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,043

Int. Cl.³ F16K *27/03, 51/00*

U.S. Cl. 251—144 **14 Claims**



1. For use in a top operated lading valve assembly located in a tank bottom and including a valve seat and threaded valve cage through which a threaded top operator extends and including a vertically movable lading valve having a lading valve opening; sufficient clearance existing between said top operator and said lading valve whereby said lading valve may rotate relative to said top operator; top operating connecting means extending downwardly through said lading valve opening; and including a depending lading valve outlet chamber, an unloading assembly for operating the lading valve assembly from the bottom comprising:

a hollow body portion having means at its upper end for connecting the body portion to the lading valve outlet chamber; bottom operating shaft means having a lower non-round end located below said body portion; said bottom operating shaft having an upper connection portion adapted to engage said top operator connecting means whereby said top operator may be rotated by said bottom operating shaft means and said lading operating shaft means and said lading valve moved vertically relative to said valve seat; said unloading assembly including means separate from said upper connection portion for preventing rotation of said lading valve while said top operator is rotated by said bottom operating shaft means.

4,440,380

WEDGEBALL VALVE

Gunter R. Behle, St. Peters, and John A. Hrinsin, St. Louis, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 28, 1982, Ser. No. 372,590

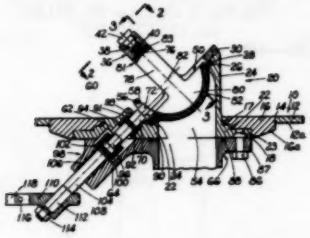
Int. Cl.³ F16K *51/00, 25/00*

U.S. Cl. 251—144 **13 Claims**

1. A valve assembly comprising:

at least two spaced ball valve segments located within a valve housing mounted within a tank; said housing including a cage extending into said tank and having an inclined sealing surface which at least are of said ball valve segments engages in closed position; a lading outlet chamber located below said inclined sealing surface and being in fluid communication with the passage through said cage; an operating shaft inclined with respect to the axis of said outlet chamber; said operating shaft passing through inclined openings provided in the valve housing and in the outlet chamber; said operating shaft including connecting means for drivably engaging and rotating said ball valve

segments; whereby movement of the operating shaft rotates said valve segments between open and closed positions, whereby one of said segments seats on said sealing surface in said closed position.

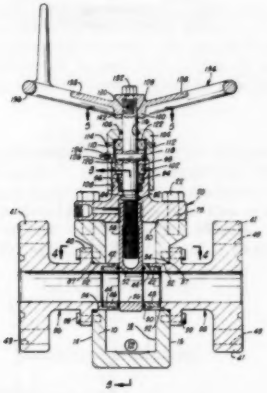


4,440,381

GATE VALVE

Robert G. Tipton, Jr., Rte. 1, Macomb, Okla. 74852

Filed Sep. 8, 1981, Ser. No. 299,968
Int. Cl.³ F16K *3/02, 3/30*
U.S. Cl. 251—214 **10 Claims**



1. A gate valve comprising:

a valve body defining a cylindrical bore opening at one side of the body, and further defining a fluid flow passageway extending through the body and intersecting the cylindrical bore at a right angle;

a pair of tubular seat ring adapters, each of which includes a sleeve portion, and wherein the sleeve portions are extended into the valve body at opposite sides thereof, and are bored at the inner end thereof to form valve seat ring shoulders, each of said seat ring adapters further including:

an annular pipe flange at its outer end adapted for coupling the gate valve into a pipe line; and

an annular second flange between the pipe flange and the respective adapter sleeve portion, and adjacent the valve body;

means fastening said second flanges of said seat ring adapters to opposite sides of the valve body;

a pair of aligned annular valve seat rings within the valve body on opposite sides of said cylindrical bore and aligned with said fluid flow passageway, each of said seat rings seated in the bore of one of said sleeve portions against the respective seat ring shoulder;

a gate reciprocably disposed in said cylindrical bore and having:

opposite sides slidably contacting said seats; and

side edges slidably contacting opposite sides of said cylindrical bore;

a bonnet assembly fastened to said body and closing the opening of said cylindrical bore;

a valve stem projecting through said bonnet and having a first end threadedly engaging said gate, and projecting through said bonnet, and having a second end, and a portion of frusto-pyramidal configuration adjacent said second end; and

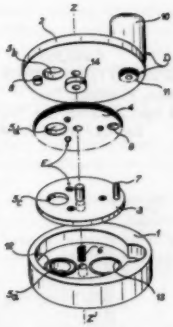
an operator handle connected to the second end of said stem from the end thereof engaging said gate, said operator handle including a hub portion having a cavity therein of frusto-pyramidal configuration, said cavity receiving said stem portion of frusto-pyramidal configuration with said stem portion of frusto-pyramidal configuration extending less than the total distance from one side of said hub to the other along the axis of said stem and having a space defined between the second end of said stem and the bottom of said frusto-pyramidal cavity, whereby said cavity bottom forms a wall against which a part of a fastening member connected to said stem can be abutted when said fastening member is extended into said stem through the second end thereof and is placed in tension.

4,440,382

VALVE WITH A DIRECT PASSAGE AND ROTARY CONTROL

Jean Pruvot, Noisy le Grand, and Andre Roquefort, Clamart, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 9, 1981, Ser. No. 310,280
Claims priority, application France, Oct. 17, 1980, 80 22263
Int. Cl.³ F16K *31/44, 25/00*
U.S. Cl. 251—248 **8 Claims**



1. A valve having a direct passage and rotary control, comprising:

a body including an orifice therethrough;

a cover adapted to sealingly engage said body and including an orifice therethrough and positioned such that when said cover is sealingly engaged with said body said orifice of said cover is axially aligned with said orifice of said body;

a first plate rotatably disposed in said body near a bottom of said body and including an orifice therethrough such that when said valve is in a valve open position for a fluid flow therethrough said orifice of said first plate is axially aligned with said orifice of said body, and when said valve is in a valve closed position said orifice of said first plate is out of alignment with said orifice of said body and said fluid flow is precluded frrom passing through said valve;

a lug integral with said first plate;

a second plate rotatably disposed between said first plate and said cover and including an orifice and a lug hole therethrough, said lug hole adapted to receive said lug therein to align said orifice of said second plate with said orifice of said first plate and wherein said first plate and said second plate are rotatably disposed about a longitudinal axis of said valve;

drive means operatively associated with said second plate for alternately rotating said second plate to said valve open position and said valve closed position, said drive means including a motor having a rotational axis parallel to said longitudinal axis and wherein said motor has a lateral dimension such that any peripheral edge of said motor does not extend beyond any peripheral edge of said valve;

a stop member integral with said cover and positioned such that said lug abuts against said stop member when said valve is in said valve closed position;

a ratchet mechanism operatively associated with said first plate and said second plate and disposed therebetween such that when said drive means alternately rotates said second plate to said valve open position and said valve closed position said ratchet mechanism is constructed so as to be operative to engage said first plate with said second plate during rotation thereof, and when said lug abuts against said stop member said ratchet mechanism is constructed so as to be operative to axially displace said first plate against said bottom of said body; and

a sealing joint disposed about said orifice of said body such that when said first plate is axially displaced by said ratchet mechanism said sealing joint is compressed in a sealtight manner about said orifice of said body by said first plate and said fluid flow through said orifice of said body is precluded.

4,440,383

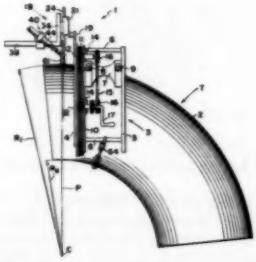
PIPE CUTTING APPARATUS

Timothy C. Dearman, Pearland, Tex.

Filed Apr. 28, 1983, Ser. No. 489,559

Int. Cl.³ B23K 7/04

U.S. Cl. 266—54 **18 Claims**



1. A stabilizer for a pipe cutter movable orbitally about an axis, said stabilizer comprising a body having a pair of parallel, spaced apart legs extending from a cross-bar; a pair of pipe engageable followers; means mounting said followers on each of the legs of said body and remote from said cross-bar so that said followers may engage a pipe; and means carried by said cross-bar substantially midway between said legs for mounting said body for rocking movements about an axis substantially parallel to the first mentioned axis.

4,440,384

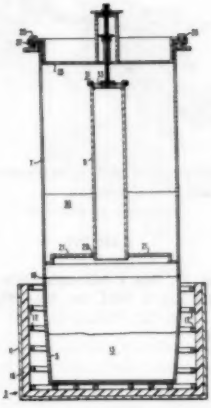
RETORT PIPE SEAL

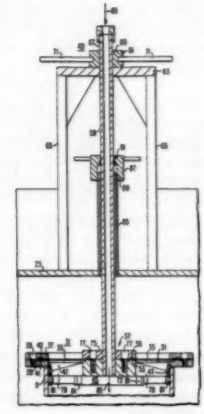
Harmon A. Evans, Ogden, Utah, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 8, 1980, Ser. No. 184,686

Int. Cl.³ C21B 7/22

U.S. Cl. 266—149 **7 Claims**





1. Apparatus for reacting chemicals, comprising:

(a) retort means for containing a first reactant;

(b) crucible means for containing a second reactant;

(c) passage means interconnecting the retort means and the crucible means;

(d) means for heating at least one of the reactants to a predetermined temperature;

(e) wall means between the retort meand and crucible means for transmitting heat therebetween by radiation;

(f) closure means in the passage means for preventing interaction between the reactants and including a diaphragm extending across the passage means in a fluid-tight manner; and

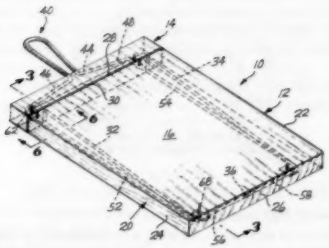
(g) opening means for opening the closure means to effect interreaction of the reactants at the predetermined temperature and including cutter means for movement against and severance of the diaphragm.

4,440,385

CUTTING BOARD WITH FUNNELING EFFECT

Dan W. Kingery, 408 S. 7th #3, Renton, Wash. 98055

Filed Nov. 23, 1981, Ser. No. 324,153
Int. Cl.³ B23Q *3/00*
U.S. Cl. 269—13 **24 Claims**



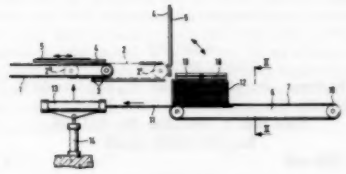
1. In a cutting board,
an upper board surface for cutting material thereon;
an opposite lower board surface on which the board is adapted to be supported during cutting;
said upper and lower surfaces being spaced;
a handle connected to and operative to lift said board;
the improvement comprising;
means connecting said handle to said board; and
means within said board to permit an end of the board adjacent the handle to be lowered with respect to said handle and to be lowered on and with respect to said means connecting when said board is lifted by said handle.

4,440,386

APPARATUS FOR FORMING STACKS READY TO BE PACKAGED FROM FLAT WORKPIECES

Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,534
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1981, 3108195
Int. Cl.³ B65H *29/68*
U.S. Cl. 271—70 **2 Claims**



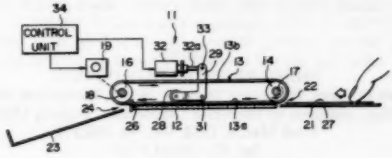
1. Apparatus for forming stacks ready to be packaged from flat workpieces such as flattened bags or sacks, comprising a depositing conveyor which is continuously and successively supplied with the workpieces by a conveyor and which consists of two parallel endless chains, the chains running over two spaced sprockets with parallel rotary axes and being hinged by two spaced pins to the front end of a depositing plate provided with rake-like fingers, and a conveyor belt which intermittently discharges the formed stacks and is disposed below the throw-off station formed by the depositing plate, the latter swinging through 180° when passing over the head end of the depositing conveyor, characterised in that the conveying plane of the discharge conveyor belt, which consists of a plurality of spaced individual belts, lies below the depositing conveyor at a distance equal to the height of the stacks to be formed, that a stacking shaft disposed beneath the depositing plate which has just swung through 180° is defined by side walls and by a rear wall provided with vertical slots, the base of the shaft being formed by fork-like prongs which are lowerable as the stack height increases, are reciprocatable in the conveying plane of the discharge conveyor, engage through slots in the rear wall and are lowerable between the individual belts in grooves of the direction-changing drum to below the conveying plane of the discharge conveyor, and that overlapping folding blades are provided which are successively horizontally movable into and out of the stacking shaft transversely over the upper edges of the side walls and the lateral prongs of the depositing plate which has been swung into the shaft.

4,440,387

SHEET FEED APPARATUS

Tadashi Ikoma; Akira Hirose, and Yohtaro Kakitani, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 891,530, Mar. 30, 1978, abandoned.
This application Jul. 26, 1982, Ser. No. 401,502
Claims priority, application Japan, Apr. 8, 1977, 52-40193
Int. Cl.³ B65H *9/04*
U.S. Cl. 271—245 **6 Claims**



1. A sheet feed apparatus comprising:
a transparent document support platen;
endless belt means disposed closely above and parallel to the platen;
drive means for rotatably driving the belt means, the platen and belt means defining an inlet and an outlet in such a manner that a sheet inserted into the inlet is fed by the belt means across the platen toward the outlet upon rotation of the belt means by the drive means;
sheet stopper means retractably provided to a downstream edge portion of the platen;
pressure means separate from the belt means for pressing the belt means and sheet together at a predetermined intermediate position; and
control means for controlling the pressure means to press the belt means and sheet together at said predetermined position with a high force upon insertion of the sheet into the inlet and with a low force as the sheet closely approaches the stopper means.

4,440,388

APPARATUS FOR STACKING THIN FLEXIBLE OBJECTS

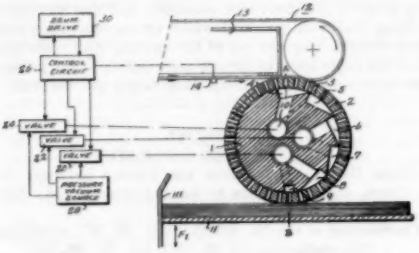
Michel Divoux, and Michel Dorez, both of Paris, France, assignors to Hotchkiss-Brandt Sogeme H.B.S., Paris, France

Filed Sep. 2, 1981, Ser. No. 298,915
Claims priority, application France, Sep. 5, 1980, 80 19260
Int. Cl.³ B65H *29/24*
U.S. Cl. 271—195 **5 Claims**

1. Apparatus for stacking thin flexible objects comprising:
a rotary drum having holes over its periphery extending to the interior thereof;
a fixed body within said interior having a plurality of chambers communicating with said holes over a half circumference of said drum from one location on said body to a second location on said body;
valve means for connecting said chambers to a source of air at a pressure above atmospheric and to a vacuum;

conveying means for delivering said objects to said drum at said one location of said body;

means for controlling said valve means so that said objects are successively engaged with the drum by suction and



rotate therewith as said chambers are successively connected to said vacuum and disengaged from said drum at said second location as said chambers are successively connected to said pressure source to produce a blowing action moving said object toward a stack of said objects.

4,440,389

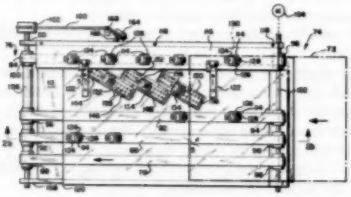
SHEET REGISTRATION DEVICE

Jack D. Ames, Irving, and David W. Smith, Richardson, both of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 355,974

Int. Cl.³ B65H 9/16

U.S. Cl. 271—251 **8 Claims**



1. A sheet registration device for receiving a sheet from a sheet input and delivering the sheet to a sheet output, while laterally aligning the sheet prior to delivery to said sheet output, comprising:

endless belt conveyor means, extending between said sheet input and said sheet output and including a plurality of endless belts,

means defining an alignment surface extending generally parallel to and to one side of said endless belts,

drive means for driving said endless belt conveyor means such that a sheet supplied to said endless belt conveyor means from said sheet input is carried by said belts to said sheet output,

alignment means, including a plurality of parallel vacuum belts and a cooperating plenum, adjacent said endless belt conveyor means and skewed with respect to said endless belts, for engaging a sheet as it is carried by said endless belt conveyor means and for transporting the sheet laterally such that a lateral edge thereof contacts said adjacent surface, said vacuum belts defining a plurality of openings through which a partial vacuum from said plenum is applied to a sheet supported thereon, said openings being sufficient in size such that a sheet is not vacuum engaged unless the sheet is supported by all of said vacuum belts, and

means for supplying a partial vacuum to said plenum.

4,440,390

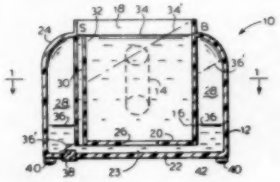
NOVELTY CUP FOR FORCIBLY EJECTING LIQUID

Clayton G. Bailey, P.O. Box 69, Port Costa, Calif. 94569

Filed Jun. 28, 1982, Ser. No. 392,735

Int. Cl.³ A63J 23/00

U.S. Cl. 272—27 N **3 Claims**



1. A novelty cup comprising:

inner and outer side walls forming a cylindrical cup chamber and a surrounding annular chamber closed at the top by an annular shoulder, the upper edge of said inner wall forming a cup lip, said inner and outer side walls and said annular shoulder being free of openings and gaps such that air may be trapped and compressed within said annular chamber;

a cup bottom between the lower edges of said outer side wall;

a second, false bottom spaced above said cup bottom and between the lower edges of said inner side wall and defining with said cup bottom a bottom chamber, said false bottom including an enlarged opening allowing fluid communication between said cup chamber, said bottom chamber and said annular chamber;

a vertical passage on said inner wall of substantially smaller diameter than said enlarged opening and extending from near said lip through said false bottom;

said cup being so constructed that when a liquid is added to said cup to a substantially greater depth than said false bottom, air is sufficiently compressed within said annular chamber, such that when said cup is tilted to where said compressed air reaches said vertical passage, said air expands against the lesser weight of liquid therein and forcibly ejects said liquid upwardly through said vertical passage.

4,440,391

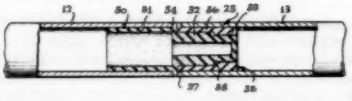
EXERCISE DEVICE

Arsenio B. Saenz, Jr., 1662 Mayfair St., and Gerald K. Cairns, 1676 Mayfair St., both of Simi, Calif. 93065

Filed Sep. 1, 1982, Ser. No. 413,968

Int. Cl.³ A63B 23/00

U.S. Cl. 272—93 **1 Claim**



1. An exercising device comprising the combination of:

a continuous, elongated bar having opposite free ends with end marginal regions;

said elongated bar being substantially hollow so as to be characterized as semi-rigid whereby said bar may be flexed or bent;

said elongated bar consisting of at least three bar sections detachably connected together at adjacent ends about the central longitudinal axis of said bar;

coupling means detachably connecting said sections together in load bearing relationship;

cushion members removably carried on the extreme free ends of said elongated bar;

said coupling means includes a cylindrical member having a projecting threaded portion carried on one of said bar sections and a cylindrical receptacle member having a threaded bore carried on another of said bar sections;

said receptacle member adapted to detachably couple with said projecting member threaded portion so that said bar sections lie on a common central longitudinal axis;

each of said coupling means members include end flanges separating the extreme opposing ends of respective bar sections coupled together; and

said coupling means members include stop means for limiting insertion of said projecting threaded portion into said threaded receptacle portion.

4,440,392

ONE PIECE MOLDED GAMES RACKET

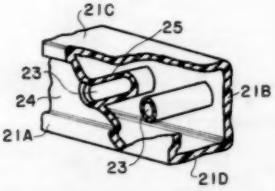
Frank W. Popplewell, Essex, England, assignor to Dunlop Limited, London, England

Division of Ser. No. 15,912, Feb. 28, 1979, Pat. No. 4,297,308. This application Jan. 29, 1981, Ser. No. 229,506

Claims priority, application United Kingdom, Mar. 7, 1978, 8925/78

Int. Cl.³ A63B 49/10

U.S. Cl. 273—73 C **15 Claims**



1. A games racket frame comprising a head and a shaft, in which at least said head is in the form of a hollow injection moulding of thermoplastics material reinforced with short filament reinforcing material, said moulding having walls formed by a first wall portion which lies at an outer circumference of said head, a second wall portion which lies at an inner circumference of said head and sidewall portions which connect with said first and second wall portions to complete the walls of the head of said frame, said first wall portion being connected to said second wall portion by an internal support means, said head having holes for stringing and said stringing holes passing through said internal support means, said moulding, including said internal support means, being an integrally-formed, seamless construction.

4,440,393

TENNIS NET SUPPORT POST

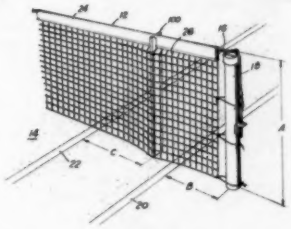
Allan J. Smith, Jr., 1621 Old Springhouse La., Dunwoody, Ga. 30338

Continuation-in-part of Ser. No. 56,322, Jul. 15, 1979, Pat. No. 4,291,875. This application Sep. 25, 1981, Ser. No. 305,476

Int. Cl.³ A63B 71/02

U.S. Cl. 273—29 BB **2 Claims**

1. A device for supporting a tennis net for regulation singles tennis play on a doubles court, the net being of the type having a top cable, a band surrounding said cable and netting depending from the band, the netting composed of a network of horizontal and vertical strands, said support comprising: an elongated subsantially rigid, vertically extending member having an upper channel having an open top and a closed bottom, a lower channel having a closed top and an open bottom; said support member having a top and a flat bottom which engages the ground, said upper channel defining a first passageway dimensioned to receive therethrough said top cable and said band and said lower channel defining a second passageway dimensioned to receive a horizontal strand of said netting, said upper and lower channel being spaced so that said first and second passageways are within the same vertical plane and said rigid support member being disposed outside of said vertical plane, and wherein said upper channel includes a leg which



horizontally extends from said support member adjacent the top of said support member, a wall upwardly extending from the end of said leg, said wall terminating in an arcuate-shaped which defines an inwardly directed groove, said top of said support member having a groove therein which is oppositely directed from said inwardly directed groove on said leg grooves defining an opening to receive therein said cable.

4,440,394

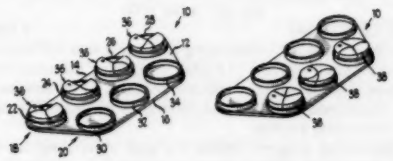
TOY PUZZLE

Alan A. Hicks, Chicago, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 12, 1982, Ser. No. 348,232

Int. Cl.³ A63F 9/10

U.S. Cl. 273—157 R **19 Claims**



9. A toy puzzle, comprising:

a base member,

a first row of a plurality of containers on said base member,

a second row of a plurality of containers on said base member,

the number of containers in said first row is a whole number X,

the number of containers in said second row is X−1, and

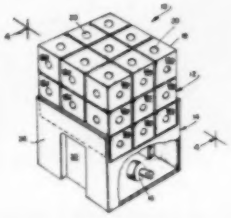
a plurality of puzzle pieces of a configuration such that said pieces can be positioned in each of said first row containers in the form of one figure, and in said second row containers in the form of another figure.

4,440,395

VARIABLE GEOMETRIC BOARD GAME

Joseph F. Hyland, c/o Palm Research, 3298 Casey Key Rd., Nokomis, Fla. 33555; Joseph J. Wetherell, 20 Woodsbridge Rd., Katonah, N.Y. 10536, and Mark Setteducati, 107 Clinton St., Emerson, N.J. 07630

Filed Dec. 11, 1981, Ser. No. 329,659
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—241 **11 Claims**



1. A variable geometric board game apparatus providing a competitive game of skill and strategy for two or more players comprising a cube with each of its six sides being color coded, said cube further being formed of interconnected articulated subcubes, a plurality of companion playing pieces, said playing pieces being attachable to selected subcubes, said subcubes being rotationally displaceable about each of three mutually perpendicular axes passing through the center of the cube for achieving an arrangement of playing pieces on consecutive subcubes bearing the same color and lying on one face of the cube.

4,440,396

METHOD FOR ENCOURAGING SELF IMPROVEMENT

Rosalie Frudakis, 2316 Locust St., Philadelphia, Pa. 19103

Division of Ser. No. 152,203, May 2, 1980, Pat. No. 4,344,625. This application Apr. 16, 1982, Ser. No. 369,189
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—242 **6 Claims**

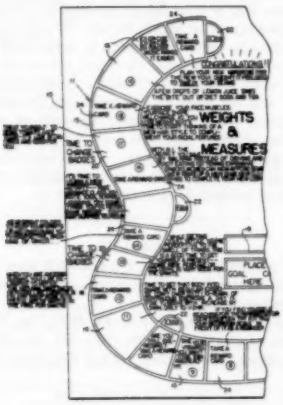
1. A method for encouraging adherence to a self-improvement program directed to a goal, comprising the steps of:

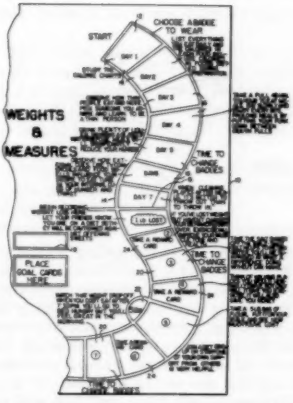
depicting the self-improvement program by an unbranched segmented path, the path having an initial portion and a remaining portion;

monitoring progress toward the goal by moving one of a plurality of playing pieces along the segmented path, the plurality of playing pieces embodying at least one of structural and pictorial characteristics reflecting stages of development in progressing toward the goal;

substituting the playing pieces one for another as the stages of development are achieved; and,

moving the appropriate playing piece along the initial portion of the unbranched path only in accordance with elapsed time and moving the appropriate playing pieces along the remaining portion of the unbranched path only in accordance with actual progress toward the goal, movement along the entire path being necessarily independent of chance, whereby at the outset of the game mental attitudes are directed towards the goal without concern for initial success in reaching the goal and whereby subsequent progress along the unbranched path





necessarily reflects only actual incremental success in progressing toward the goal.

4,440,397

TAX BOARD GAME

Alfred N. Butner, 14565 Harvard Ct., Los Altos Hills, Calif. 94022

Continuation of Ser. No. 228,619, Jan. 26, 1981, which is a continuation of Ser. No. 36,182, May 4, 1979, abandoned. This application Jan. 18, 1982, Ser. No. 340,126
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—256 **2 Claims**

1. In a board game, the combination comprising:

a marker for each player;

a board with a path for movement of the marker through predetermined spaces;

means to randomly determine the number of spaces of movement for each marker;

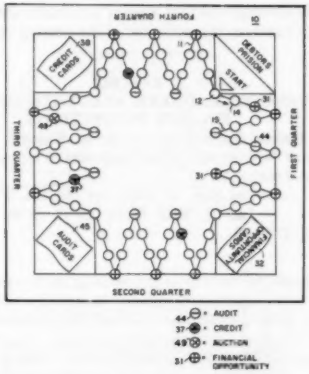
a supply of play money to be at least partially distributed to the players and comprising two indentifiable sets of the same type of money representing taxable and non-taxable income;

means on the board identifying the two sets of money for determining an amount of money from one or both of the

two money stes to be distributed to each player whose marker lands at predetermined spaces on said board;

means for applying an individual tax status to each player including a plurality of cards indicating the tax status for that player receiving the card for all subsequent tax calculations until another event changes that status for the player;

a plurality of said predetermined spaces correlated to the cards and instructing the player landing thereon to draw one of said plurality of cards having preselected tax consequences for changing the tax status for the player whose marker lands on the spaces; a calculator for determining



the taxes owed on the taxable money by each player including a tax status indicator and means to calculate the tax to be paid by each player by setting the calculator to indicate the individual tax status of the player and the taxable play money received by the player for a preceding time period and reading from the calculator the resulting tax liability; and

means to assign and maintain a continuing account of the net financial worth of each player after calculating with the calculator the tax consequences of each player on a periodic basis including a determination of the play money held by each player.

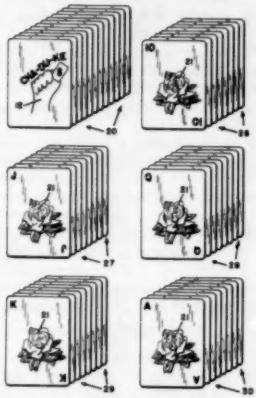
4,440,398

CARD GAME AND METHOD OF PLAYING SAME

Alfred G. Charon, Cloquet, Minn., assignor to Cha-Du-Ke, Cloquet, Minn.

Filed May 24, 1982, Ser. No. 381,039
Int. Cl.³ A63F *1/00*
U.S. Cl. 273—292 **9 Claims**

6. A game apparatus comprising a deck of fifty-two cards, said cards having exactly six distinguishable groups of cards, a first group of cards having exactly twelve cards, second through sixth groups of cards each having exactly eight cards, said cards in said first group being similarly marked and distinguishable from said cards of said second through sixth groups, said cards of said second through sixth groups including dis-



similar indicia establishing a ranking between said second through sixth groups of cards.

4,440,399

AMUSEMENT GAME

David A. Smith, R.R. #5, Vandalia Acres, Jacksonville, Ill. 62650

Filed May 31, 1983, Ser. No. 499,343
Int. Cl.³ A63B *63/00, 63/06*
U.S. Cl. 273—346 **5 Claims**

1. A game comprising a vertically-disposed rod having recessed spiral grooves therein spaced along its entire length with reversed spiral grooves medially the ends of said rod, upper and lower stabilizer plates secured to said rod at each end thereof and having inner faces, said upper plate having equi-distantly spaced apertures therein, a gravity rotating plate on said rod, equi-distantly spaced, triangular-like cutouts in said rotating plate, said lower stabilizer plate having equi-distantly spaced, triangular areas covered with Velcro, and a ball having a strip of Velcro around its periphery.

4,440,400

PLAYING OR TRAINING DEVICE

Manfred Neuberger, Hockenheim, Fed. Rep. of Germany, assignor to Conpaten, Ltd., St. Helier, Channel Islands

Continuation of Ser. No. 906,884, May 17, 1978, abandoned.
This application Apr. 28, 1980, Ser. No. 143,993
Claims priority, application Fed. Rep. of Germany, May 21, 1977, 2723092
Int. Cl.³ A63B *69/22*
U.S. Cl. 273—411 **14 Claims**

1. A playing and/or training device which indicates a preci-

sion with which desired impacts by a player on a ball may be designated, comprising

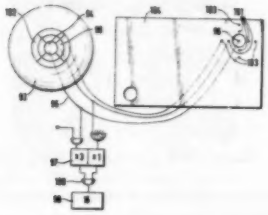
a ball to be impacted,

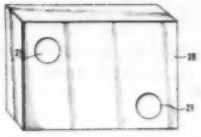
at least two impact pressure sensing means within said ball for sensing impacts directed onto at least two predetermined areas of the surface of said ball,

indicating means responsive to an impact on the area of said ball containing said sensing means for providing an indication when the said sensing means senses an impact,

resilient means for supporting said ball between two lateral support means,

each impact pressure sensing means comprising a switch contact actuated by a pressure acting on said switch





contact because of an impact in an area in which said switch control is placed,

said indicating means comprising lamps, each lamp being connectible to an electric source by one of said switch contacts when the ball surface is impacted at the predetermined area assigned to said lamp,

a target indicator panel,

said target indicator panel including said lamps which are positioned relative thereto for visual observation by the player whereby each lamp is topographically arranged within the target indicator panel to represent a target which said ball will hit if impacted at the corresponding predetermined area of its surface to activate a sensing means.

4,440,401

SEAL ASSEMBLY FOR BEARING CUPS SLIDABLE IN AXIAL DIRECTION IN BORE

Armin Olschewski; Gerhard Herrmann, both of Schweinfurt, and Bernhard Bauer, Hassfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

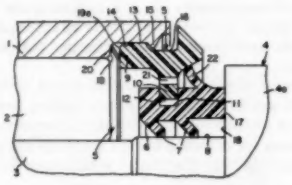
Filed May 13, 1983, Ser. No. 494,435

Claims priority, application Fed. Rep. of Germany, May 15, 1982, 8214245

Int. Cl.³ F16J *15/32, 15/38*

U.S. Cl. 277—50 **7 Claims**

1. Sealing arrangement for bearing cups, in particular, for universal joints, consisting of a support body connected to the bearing cup and a seal ring which is fastened to a flange of the support body, characterized in that the support body (5, 23) has a relatively wide guide section (13) at the outside surface and is arranged limited slidable in axial direction in the bore of the bearing cup (1) and in that the seal ring (6) rests with a



radially running face (17) against a shoulder (18) of the machine component (4) supported in the bearing cup (1).

4,440,402

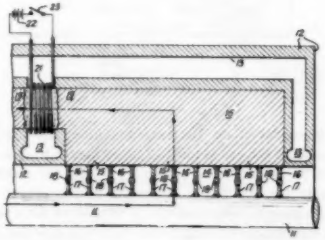
FERROFIN MAGNETIC SEAL WITH OPPOSED FIN-LIKE PROJECTIONS

Oscar Pinkus, Guilderland, and Jed A. Walowit, Clifton Park, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Mar. 25, 1982, Ser. No. 361,787

Int. Cl.³ F16J *15/16, 15/44, 15/40*

U.S. Cl. 277—80 **19 Claims**



1. A ferrofin magnetic fluid seal comprising a shaft having a magnetically permeable portion supporting a plurality of concentric fin-like projections of magnetically permeable material circumferentially arrayed in parallel along a portion of the axial length of the shaft, a housing surrounding and rotatably supporting said shaft, said housing having a seal forming section having a plurality of parallel, axially arrayed fin-like projections made from magnetically permeable material circumferentially surrounding the interior of the housing and opposing said axially arrayed, parallel concentric fin-like projections on said shaft portion, a magnetic fluid disposed within the gaps defined between the ends of the opposing fin-like projections extending from said shaft portion and from said surrounding housing seal forming section, said housing seal forming section being fabricated from magnetically permeable material and being physically disposed in a closed series magnetic circuit with a source of magnetic flux, said closed series magnetic circuit further including the axially arrayed, concentric fin-like projections extending from said housing, the magnetically permeable shaft portion and the axially arrayed, concentric fin-like projections extending therefrom and the magnetic fluid droplets disposed in the gaps between the opposing ends of the sets of opposing fin-like projections, the fin-like projections on the magnetically permeable shaft portion and on the seal forming section each have a tooth width t and a tooth spacing s which are optimized so as to yield a maximum number of magnetic seal stages N over a given axial length L of the shaft in accordance with the expression $N_{max}=L/(t+s)$, and the ends of the opposing fin-like projections being spaced apart a distance h that defines the gaps in which the magnetic fluid is trapped to form the magnetic seal and wherein optimum seal-

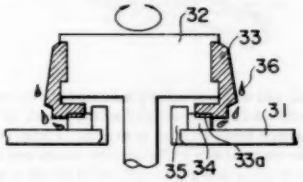
ing capacity is obtained where t ranges in value from substantially h to 5h and s ranges in value from substantially 2h to 3h.

4,440,403

DROP-PROOF AND DUST-PROOF DEVICE IN ROTARY OPERATION SECTION OF CAMERA

Fumio Urano, Omiya, and Junji Umetsu, Kita, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1978, Ser. No. 906,802
Claims priority, application Japan, May 30, 1977, 52/69535[U]; May 30, 1977, 52/69536[U]
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—81 R **2 Claims**



1. In a camera of the type having an external camera casing, an aperture in said casing, an annular projecting portion of said casing surrounding said aperture, a rotatable shaft passing through said aperture and a camera operating member secured to said shaft outside of said camera casing, a water-proof and dust-proof seal comprising:

an intermediate ring member slidably fitted at a circumferential surface around said annular projection, said annular projection being provided with v-shaped grooves on its outer periphery; and

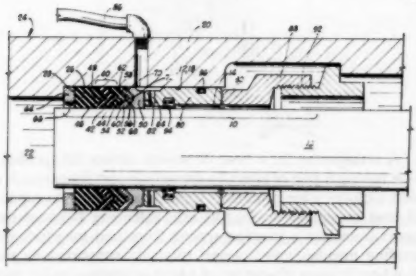
an annular flexible ring securing said intermediate ring to said operating member whereby said operating member is freely rotatable and said flexible ring accommodates eccentricities in the rotational movement of said operating member.

4,440,404

PACKING ARRANGEMENT

James D. Roach, Henderson, Colo., and Clinton W. Cole, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 9, 1982, Ser. No. 406,546
Int. Cl.³ F16K *43/00*
U.S. Cl. 277—124 **23 Claims**



1. A packing assembly for sealing an annular space between a pump plunger and a pump body of a reciprocating plunger pump, said assembly comprising:

a radially compressed elastomeric header ring means disposed in a high pressure end of said annular space, for preventing migration of fluid through said annular space;

packing ring means disposed in said annular space behind said header ring means, said packing ring means including at least one V-shaped packing ring with a concave side of said packing ring facing said header ring means;

a female adapter ring disposed in said annular space behind a last V-shaped packing ring of said packing ring means; and

a V-shaped anti-extrusion ring means disposed in said annular space between said last V-shaped packing ring and said female adapter for preventing extrusion of said last V-shaped packing ring between said female adapter and each of said pump plunger and said pump body, said anti-extrusion ring means including:

a concave side engaging said last V-shaped packing ring;

a convex side engaging a forward concave side of said female adapter; and

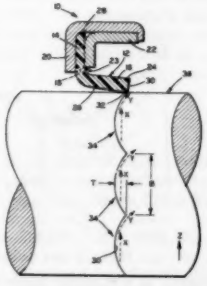
radially inner and outer sealing surfaces for engaging said pump plunger and said pump body, respectively.

4,440,405

HYDRODYNAMIC SHAFT SEAL WITH CONTINUOUSLY DIVERGENT SEAL ELEMENT

Jerome E. Schaus, Glen Ellyn, and Daniel Danek, Berywn, both of Ill., assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 29, 1982, Ser. No. 426,501
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—134 **9 Claims**



1. In a hydrodynamic shaft seal including a sealing element comprising two radially extending faces, generally concentric annular inner and outer edges defining the boundaries of said faces, said element further comprising a radially outwardly extending fixed body portion, and a radially inwardly extending flexible body portion; an improvement comprising said faces having a continuous divergence from said outer edge to said inner edge, said divergence comprising an increasing lateral separation of said faces from said outer edge to said inner edge in the range of 0.006 to 0.060 inch per inch of radial length of said flexible body portion.

4,440,406

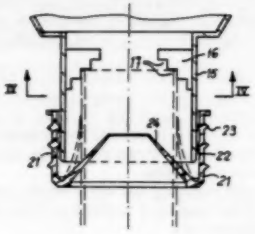
DEVICES USED FOR THE CONNECTION OF PIPES

Kurt S. B. Ericson, 48, Prins Boudewijnlaan, B-2230 Schilde, Belgium

Division of Ser. No. 145,729, May 1, 1980, Pat. No. 4,318,547. This application Jan. 8, 1982, Ser. No. 338,142
Claims priority, application Belgium, May 4, 1979, 194985
Int. Cl.³ F21S *1/12*; F16J *15/32*
U.S. Cl. 277—207 A **4 Claims**

1. A device for connecting a tubular body with pipes of different sizes, said device comprising: a connecting muff of flexible material having a flexible lip which is fixedly connected with the inner wall of the muff and which projects towards the longitudinal axis of the muff so as to leave a central

opening, said lip being extensible in order to accommodate pipes of different sizes, and guiding and centering means for the pipes, said guiding and centering means being connected to the inner periphery of the tubular body in the form of projections, each projection having a staggered section defining locating surfaces for the pipes in such a manner that whatever the size of the pipe the lip becomes deformed and tightly engages the pipe introduced thereinto.



4,440,407

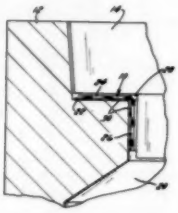
MANHOLE COVER GASKET SEAL

Michael Gagas, 5558 N. Shoreland Ave., Milwaukee, Wis. 53217

Filed Nov. 24, 1982, Ser. No. 444,504

Int. Cl.³ F16J *15/10*

U.S. Cl. 277—212 F **9 Claims**



1. The combination of a manhole frame having a circular opening and a recess around the opening forming a manhole cover seat, and

a manhole cover positioned on said seat, the improvement comprising

a manhole cover gasket seal for sealing the manhole cover in the recess of the manhole frame, said seal comprising

a first annular section having an inner diameter substantially equal to the diameter of the opening in the manhole frame and

a second annular section having an outer diameter substantially equal to the diameter of the opening in the manhole frame, said second section being secured to said first section, whereby said first section forms a seal between the manhole cover and the seat around the opening in the frame and said second section holds the first section in position around the opening in the manhole frame.

4,440,408

RECREATIONAL SLEIGH

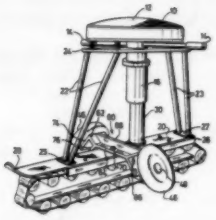
Boris A. Velman, 25 Cedarcroft Blvd., Apt. 606, Willowdale, Ontario, M2R 2Z3, Canada

Filed Oct. 19, 1981, Ser. No. 312,196

Int. Cl.³ B62D *55/00*

U.S. Cl. 280—7.12 **3 Claims**

1. A recreational device comprising a seat, a ski having means formed thereon permitting travel over a ground surface, support means interconnecting said seat to said ski a predetermined distance apart to permit a user to sit on said seat over the ski, a pair of opposed handles which extend laterally from the underside of the seat perpendicular to the longitudinal axis of the ski, a continuous belt mounted on the underside of the ski, said endless belt having a plurality of rollers mounted thereon a substantially equal distance apart adapted to engage and roll on the ground, and a pair of wheels mounted one on each side of said ski within a central one-third of the length of the ski, each of said wheels being inclined at an angle of from about 20° to 30° from the vertical axis of the support means and inclined away from each other facing the front end of the ski at an angle of from about 15° to 20° from the longitudinal axis of the ski.



4,440,409

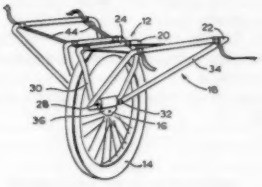
BOAT TRANSPORTER

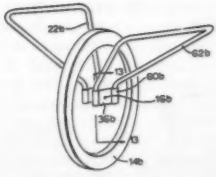
Alan B. Margison, 54 Amelia, Elmvale, Ontario, Canada L0L 1P0

Filed Jul. 13, 1981, Ser. No. 282,489

Int. Cl.³ B62B *1/10*

U.S. Cl. 280—47.13 B **7 Claims**





1. A transporter for a boat or similar device comprising a cradle having a pair of laterally spaced support frames each of which includes a longitudinally extending member to support said boat or similar device, an axle extending between said support frames at a location spaced from said longitudinally extending member and a wheel rotatably supported on said axle whereby upon placement of a boat or similar device upon said cradle said wheel supports said boat or similar device and permits movement thereof, said axle being received in a pair of brackets spaced along the longitudinal axis of said transporter, and each of said frames having a pair of terminal portions which are slidably received in respective sockets to secure said

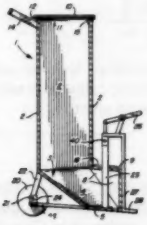
frame to said axle, said terminal portions being cranked out of the plane of said frame member whereby said frame is reversible on said bracket to enable said frames to be secured in either a mutually divergent position or a mutually converging position.

4,440,410

HOPPER FOR CONTAINING DRYWALL JOINT COMPOUND

Larry R. Bradshaw, 1703 Shely St., Longview, Tex. 75604

Filed Nov. 30, 1981, Ser. No. 325,749
Int. Cl.³ B62B 1/10; B67D 5/50
U.S. Cl. 280—47.26 7 Claims



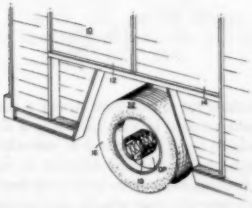
1. A hopper for containing liquid joint cement comprising a supply container having an open top and a generally funnel-shaped bottom portion; and a pump support characterized by a pump support deck extending from said supply container in a slightly downward slope; a pump support front extending essentially vertically downwardly from said pump support deck and defining a frontal extremity of said pump support means; and pump support sides extending rearwardly from said pump support front and downwardly from said pump support deck to said bottom portion of said hopper and an access aperture in said pump support deck for inserting a pump into the interior of said bottom portion to pump joint cement from said hopper.

4,440,411

VEHICLE HUB STEP

Walter R. Hess, 690 Washington Ave., Carlstadt, N.J. 07072

Filed Jun. 17, 1982, Ser. No. 389,351
Int. Cl.³ B60R 3/00
U.S. Cl. 280—165 6 Claims



1. A vehicle hub step comprising:

a cylinder of mesh-like material having inner and outer ends;

inner and outer rings secured to said inner and outer ends; and

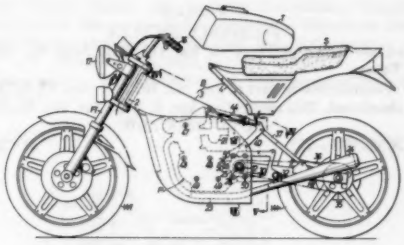
a plurality of bars having flanges thereon secured in spaced apart relationship about the inner circumference of the cylinder, said flanges having aperatures therein for receiving the threaded ends of hub studs whereby the hub step is secured to the hub of the vehicle by suitable nuts.

4,440,412

MOTORCYCLE

Tadashi Kamiya, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1980, Ser. No. 152,103
Claims priority, application Japan, May 26, 1979, 54-65237
Int. Cl.³ B62K 11/04
U.S. Cl. 280—281 B 1 Claim



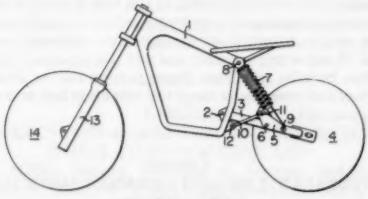
1. A two-wheeled motorcycle comprising a steamlined cowling structure forming a part of the vehicle frame and having a pair of side sections, a roof section interconnecting said side sections at their top, and a bottom section interconnecting said side sections at their bottom; a power unit accommodated in said cowling structure and connected at its opposite sides to said respective side sections of said cowling structure, said side sections having at their inside a plurality of pairs of reinforcing and power unit supporting bosses in face-to-face relation to the adjacent sides of said power unit, said cowling structure being formed at its rear end with an opening through which said power unit is inserted into and removed from said cowling structure.

4,440,413

REAR WHEEL SUSPENSION FOR A MOTORCYCLE

Shinichi Miyakoshi, Fujimi, and Kazuhiro Yamamoto, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 119,485, Feb. 7, 1980, Pat. No. 4,322,088.
This application Jul. 22, 1981, Ser. No. 285,792
Claims priority, application Japan, Feb. 13, 1979, 54-16827[U]
Int. Cl.³ B62K 25/04
U.S. Cl. 280—284 4 Claims



1. A rear wheel suspension for a motorcycle comprising: a body frame, a rear wheel support frame pivotally mounted on said body frame for upward and downward movement relative thereto and rotatably supporting a rear wheel, a rear shock absorber having opposite ends and disposed between said body frame and said rear wheel support frame for damping relative movements between said body frame and said rear wheel, lever plate means pivotally mounted on said rear wheel support frame, said lever plate means having a first arm and a second arm extending in the opposite directions, said first arm being pivotally connected to one end of said rear shock absorber which is pivoted at the other end thereof to said body frame,

said second arm being connected to said body frame through a pull rod, whereby the rate of increase in the compression stroke of said shock absorber is increased in proportion to the upward movement of said rear wheel relative to said body frame due to the combined action of the upward movement of said rear wheel support frame and the pivotal movement of said lever plate means relative to said rear wheel support frame.

4,440,414

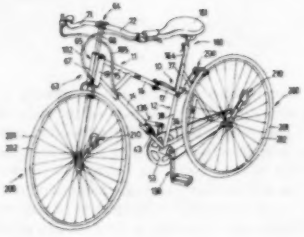
FOLDABLE BICYCLE

Fu-Chow Wang, 4 Fl., 17-3, La. 113, Shia Men St., Taipei, Taiwan

Continuation-in-part of Ser. No. 103,917, Dec. 17, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,040

Int. Cl.³ B62K *15/00*

U.S. Cl. 280—287 **21 Claims**



1. A foldable bicycle which comprises: a handlebar structure; a front frame portion comprised of an upper diagonal brace, a lower diagonal brace, a front inclined tube bridging said upper and lower diagonal braces, and a steering column, said steering column being connected to said handlebar structure and forming with said upper and lower diagonal braces a triangular form; a rear frame portion; a hinge bolt, said hinge bolt axially connecting said rear frame portion to said front frame portion; said handlebar structure having a steering bolt and being connected to said front frame portion by said steering bolt; a seat structure connected to said rear frame portion; a right and left pedal structure, said right and left pedal structure being opposingly connected to said rear frame portion; a front wheel assembly and a rear wheel assembly, said front and rear wheel assemblies each having brake mechanisms connected thereto, said front wheel assembly being removably connected to said handlebar structure, said rear wheel assembly being removably connected to said rear frame portion; and at least one over-center hinge for hingedly connecting said rear frame portion to said front frame portion, whereby upon removal of said wheel assembly and said seat structure from said foldable bicycle, said front frame portion can be folded by means of said over-center hinge and said hinge bolt into a small triangular unit.

4,440,415

HYDRAULIC LIFT ARM ASSEMBLY MOUNTING ARRANGEMENT

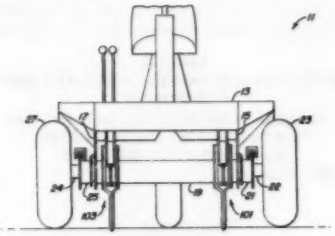
Lloyd A. Wykhuis, and John B. Kuhn, both of Mayville, Wis., assignors to Deere & Company, Moline, Ill.

Filed Dec. 20, 1982, Ser. No. 450,877

Int. Cl.³ B60D *1/00*

U.S. Cl. 280—460 A **3 Claims**

1. In combination with a unibody frame structure having an axle tube extending longitudinally between opposing sidewalls of said unibody frame structure, a lift assembly pivotally mounted to the axle tube, said lift assembly comprising: a first generally S-shaped lift arm; a second generally S-shaped lift arm, first means for rotatably mounting said lift arms around said axle tube such that said lift arms are in spaced apart relationship in the region in close proximity to said axle tube and in abutting parallel alignment at the other end; a hydraulic cylinder having a displaceable cylinder arm, said cylinder arm being pivotally mounted to said lift arms in said region in



spaced apart relationship; and, second means for pivotally mounting said hydraulic cylinder to said axle tube between said lift arms in said spaced apart region.

4,440,416

AGRICULTURAL MACHINE

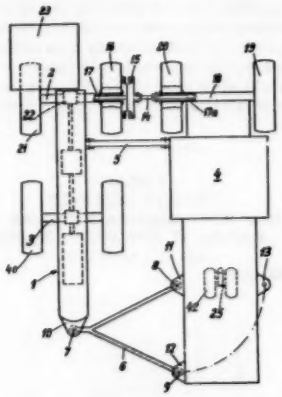
Helmut Claas, and Nils Frederiksen, both of Harsewinkel, Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,558

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109409

Int. Cl.³ B60D *1/14*

U.S. Cl. 280—473 **17 Claims**



1. In a machine for agricultural works, a combination comprising a multi-purpose vehicle including a driven front axle with front wheels and a rear axle with steerable rear wheels, a motorless agricultural machine coupled to said vehicle and including a non-steerable front axle with front wheels and a rear axle with steerable rear wheels; and means for selectively connecting said agricultural machine to said vehicle in one position in which said agricultural machine is disposed laterally of said vehicle for operation on a field and another position in which said agricultural machine is disposed behind said vehicle for transportation along a road, said connecting means including a connecting rod connectable between said vehicle and said agricultural machine to maintain them in said first position, a coupling linkage pivotally interconnected between said vehicle and said agricultural machine, and means for coaxially aligning the front axle of the agricultural machine

with the front axle of the vehicle when the vehicle and the agricultural machine are in said first position.

4,440,417

HITCH ASSEMBLY

Jerry K. Kirchner, 1314 - 13th St. S., Lethbridge, Alberta, Canada T1K 1S9

Filed Mar. 18, 1982, Ser. No. 359,251

Int. Cl.³ B60D *1/00*

U.S. Cl. 280—478 R **31 Claims**

1. An adjustable hitch assembly for connecting a towed device such as an implement, trailer or the like, to a towing vehicle such as a car, truck, tractor or the like, said towed device including a tow bar, said towing vehicle including a draw bar having a front connecting means and a rear hitch connecting aperture spaced from said front connecting means; comprising in combination a scissors action having a rear hitch connection to the towed device at one end thereof and a front hitch connection to the towing vehicle at the other end thereof, a control plate operatively connected by one end thereof adjacent to a location intermediate the ends of the scissors action and connectable by the other end thereof to the front hitch connection at the other end of said scissors action, said scissors action being movable from a fully retracted position to a fully extended position and vice-versa and any position therebetween, stops on said control plate and on said scissors action engageable with the sides of the draw bar when installed thereon, to align the front connecting means with the rear connecting means when said scissors action is fully retracted and locking hitch means engageable through said scissors action and said rear hitch connecting aperture of said draw bar when said scissors action is fully retracted.

4,440,418

SKI BASE COATING

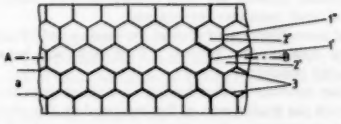
Adolf Staufer, Molln, Austria, assignor to TRAK Sportartikel GmbH, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,658

Claims priority, application Austria, Oct. 2, 1980, 4921/80

Int. Cl.³ A63C *7/06*

U.S. Cl. 280—604 **21 Claims**



1. A ski base coating including a push-off aid which comprises a plurality of steps having steep gradient push-off flanks in a push-off direction and flat angle ramps in a gliding direction, the upper side of the steps being formed of a continuous honeycomb arrangement of hexagonal fields (2', 2''), each having sides and a hexagon face, wherein the fields (2', 2'') are so arranged that one of the hexagon sides (1', 1'') each extends transversely of the push-off direction, that said hexagon side (1', 1'') is designed as a push-off edge, and that the hexagon faces form the flat angle step ramps.

4,440,419

INDIVIDUAL WHEEL SUSPENSION FOR NON-STEERED MOTOR VEHICLE WHEELS EXHIBITING A CHANGE IN CAMBER WHEN SPRUNG, ESPECIALLY ON AUTOMOBILES

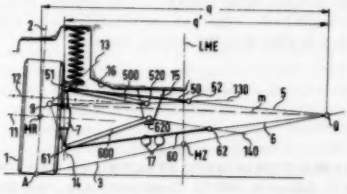
Werner Kosak, Dachau, and Wolfgang Matschinsky, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,607

Claims priority, application Nov. 14, 1980 European Pat. Off. 80107073.1

Int. Cl.³ B62D *17/00*

U.S. Cl. 280—661 **13 Claims**



1. An individual wheel suspension for a non-steered wheel of a motor vehicle having a vehicle body and a wheel support wherein a change in camber of the wheel is exhibited during spring deflection, comprising a trailing arm which is rigidly connected to the wheel support and articulated to the vehicle body by means of a lengthwise arm disposed in the lengthwise direction of the vehicle and in a direction running transversely to the vehicle by means of two wishbones located one above the other, the wishbones form auxiliary tie rods in a transverse plane running vertically through the center of the wheel, extensions of said tie rods beyond the center of the vehicle intersect at a transverse pole located at a distance from the wheel center plane, said auxiliary tie rods include articulations to the wheel support which are provided at an additional distance determined relative to said transverse pole in the vicinity of the wheel center plane, the auxiliary tie rod of the lower wishbone is at least approximately half as long as said additional distance and the upper wishbone forms an auxiliary tie rod whose length is less than or equal to that of the auxiliary tie rod of the lower wishbone, said lengthwise arm is arranged pointed forward in the direction of travel of the vehicle with the articulation of the lengthwise arm to the vehicle body being located above the wheel axle and in the vicinity of the wheel center plane.

4,440,420

INDEPENDENT SUSPENSION OF A STEERABLE WHEEL TO MOTOR VEHICLES

Rudolf Müller, Dachau, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,930

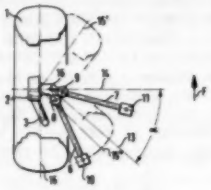
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138850

Int. Cl.³ B60G *3/20*

U.S. Cl. 280—691 **3 Claims**

1. An independent wheel suspension for a steered wheel of a motor vehicle, comprising wheel carrier means, means for guiding the wheel during spring and steering movements including transverse guide means operatively connecting the lower area of the wheel carrier means with a vehicle superstructure and two individual guide members operatively connecting the upper area of the wheel carrier means with the vehicle superstructure, the wheel being pivotal about an ideal

instantaneous pivot axis which results from line of intersection of the two planes that are defined respectively by the lower pivot paint at the wheel carrier means and the two axes of the upper guide members, characterized in that—as viewed in plan



view—the symmetry line with respect to the upper two guide members subtends in the straight driving position of the wheel an acute angle to the wheel axis and is located to the rear of the wheel axis as viewed in the driving direction.

4,440,421

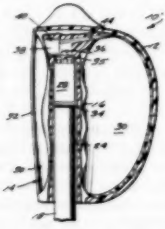
SKI POLE GRIP WITH ELECTRICAL HEATING

Jerome E. Adamson, 400 W. Brambleton Ave., Ste. 300, Norfolk, Va. 23510

Division of Ser. No. 198,067, Oct. 17, 1980, Pat. No. 4,343,490. This application May 18, 1982, Ser. No. 379,496

Int. Cl.³ A63C *11/22*

U.S. Cl. 280—821 **5 Claims**



1. A ski pole hand shield comprising:

a substantially rigid enclosure member having means defining an access opening thereto, and dimensioned to enclose a skier's hand;

a hand grip disposed within said enclosure member and accessible through said access opening; wherein said hand grip comprises means defining a central bore therein and an opening to the central bore at a first end thereof; and wherein said enclosure member has an opening therein aligned with the opening and central bore of said hand grip so that an end of ski pole may be inserted through said aligned openings into said central bore and held by said hand grip;

a rechargeable battery mounted within said hand grip central bore adjacent a second end thereof, opposite said first end;

a socket electrically connected to said rechargeable battery and mounted in said hand grip adjacent said enclosure member across opening, said socket being adapted to be connected to an external source of electrical energy for recharging said battery; and

means for transforming electrical energy from said battery to heat so that a major portion of a skier's hand within said enclosure may be heated.

4,440,422

SECTIONALIZED PAPERBACK BOOK

Edward R. Bruchas, 115 Moyna Dr., Hendersonville, Tenn. 37075

Filed Aug. 4, 1982, Ser. No. 405,250

Int. Cl.³ B42B *9/00*

U.S. Cl. 281—15 R **6 Claims**

1. A paperback book comprising a plurality of sections each section comprising a plurality of pages, at least one dividing page between each pair of contiguous sections, said dividing page being stiffer than the pages of the sections, and a spine secured to adjacent edges of all pages so as to bind them together, said spine being longitudinally perforated at each dividing page whereby adjoining sections may be divided by tearing the spine along said perforations.

4,440,423

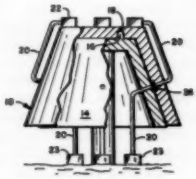
CONTROL CONNECTOR

John R. Pfeifler, II, Oxnard, Calif., assignor to Vetco Offshore, Inc., Ventura, Calif.

Filed May 27, 1982, Ser. No. 382,510

Int. Cl.³ B61G *5/08*; F16L *35/00, 55/00*

U.S. Cl. 285—25 **6 Claims**



1. An underwater hydraulic control connector, comprising:

a cap member;

a head member, the cap and head members being engagable each with the other;

a means for aligning the cap and head members during engagement;

a plurality of conduits in the cap and head members, each cap member conduit mating with a corresponding head member conduit for fluid communication when the cap and head members are engaged;

a seal assembly located around the mating end of each of the cap conduits for forming a fluid tight seal between the mated conduits;

the cap member further having an annular groove disposed about the mating end of the cap conduit, the groove having an increasing diameter at an increasing depth beneath the mating surface of the cap member;

the seal assembly further comprising,

a resilient packing member configured to fit closely into at least the portion of the annular groove of increasing diameter for retention thereby, and comprising an inner sealing lip for forming an annular seal around the mating end of the cap member conduit, said inner lip having a first diameter, and an outer sealing lip for forming an annular seal around the mating end of the head member conduit when

the cap and head members are engaged, said outer lip having a second diameter at least as great as said first diameter, the packing member further having an annular channel between the inner and outer sealing lips, the bottom of the channel having a diameter at least as great as said second diameter, and

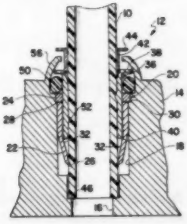
a resilient ring of a substantially circular cross-section, disposed in the channel and retained therein, for axially urging said inner sealing lip against the cap member and said outer sealing lip against the head member, when the members are engaged.

4,440,424

RELEASABLE COUPLING DEVICE

Paul Mode, Westfield, N.J., assignor to Nycoil Corporation, Fanwood, N.J.

Filed Jun. 2, 1978, Ser. No. 912,003
Int. Cl.³ F16L *21/06*
U.S. Cl. 285—39 **8 Claims**



1. A releasable coupling device for a tube, said releasable coupling device comprising: a fitting having a bore therein and an opening into the bore through which the tube is to be inserted, the internal diameter of said opening being greater than the diameter of said bore; a retaining ring in said opening having a plurality of axially extending, inwardly biased fingers adapted to engage said tube when said tube is inserted into said fitting towards said bore so that said tube is restrained against axial movement out of said fitting; unlocking means for forcing said plurality of fingers radially outward to cause disengagement of said fingers from said tube; and wherein said retaining ring comprises a multi-sided web portion having said plurality of fingers depending therefrom, adjacent sides of said web portion defining a plurality of conrners, the diameter of an imaginary circle passing through said corners being greater than the diameter of said opening before said retaining ring is inserted in said opening and the diameter of an imaginary circle passing through the mid-point of said sides being less than the diameter of said opening before said retaining ring is inserted in said opening whereby said retaining ring may be support solely within said opening by the engagement of said corners against the side wall of said opening when said retaining ring is inserted into said opening.

4,440,425

FLEXIBLE CONDUIT SYSTEM

Harold T. Pate, Cleveland, and Helmut P. Fochler, Chagrin Falls, both of Ohio, assignors to Indian Head Inc., New York, N.Y.

Division of Ser. No. 78,376, Sep. 24, 1979, which is a division of Ser. No. 875,229, Feb. 6, 1978, Pat. No. 4,248,459. This application Mar. 30, 1982, Ser. No. 363,512
Int. Cl.³ F16L *41/00*
U.S. Cl. 285—161 **2 Claims**

1. An inlet fitting for engaging a corrugated tubing section to an electrical box having an opening in a side wall thereof comprising:

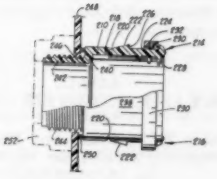
a generally cylindrical body severed along parallel, axially extending lines to define a pair of opposed clamping portions of arcuate cross-sectional configuration pivotable radially outwardly relative to the axis of the cylindrical body, said cylindrical body further including a medial cylindrical body portion having one side connected to one of the ends of each of said clamping portions, and having an opposite side, each of said clamping portions including:

a plurality of axially spaced, radially inwardly extending teeth projecting toward the axis of the cylindrical body from the radially inner side of the respective clamping portion;

a hinge section of radially reduced thickness adjacent said medial cylindrical body portion and connecting said one end of the respective clamping portion to said cylindrical body portion to hingedly interconnect the respective clamping portion to the medial cylindrical body portion for radial pivotation of the respective clamping portion about said hinge section of radially reduced thickness;

a free end opposite said one end of the respective clamping portion;

an inclined surface sloping radially outwardly from a relatively thin radial section to a relatively thick radial section in an axial direction from a location adjacent said hinge section toward the free end of the respective clamping portion, said inclined surface terminating in a first radially extending shoulder spaced axially from the free end of the respective clamping portion and spaced axially from said teeth toward said hinge section; and



a radially outwardly projecting end portion of the respective clamping portion adjacent the free end thereof spaced from said shoulder and defining with said shoulder a locking collar-receiving recess extending transversely across the clamping portion, said recess having a bottom which is in coplanar alignment with the external surface of said generally cylindrical body;

a cylindrical nipple of smaller diameter than said cylindrical body;

a second radially extending shoulder extending between, and interconnecting, one end of said nipple with a side of said cylindrical body opposite the side thereof connected to said clamping portions; and

an annular locking collar having a greater internal diameter than the outer diameter of said cylindrical body mounted on, and surrounding, said cylindrical body, and axially slidable on said cylindrical body to a position around said clamping portions in which said locking collar is retained in said recesses to retain said clamping portions in a conduit-engaging position extending parallel to the axis of the cylindrical body, said annular locking collar including a radially inner surface adapted to cooperate with said inclined surface to allow said locking collar to be slid over said inclined surface as said locking collar is moved axially from a location adjacent said second radially extending shoulder, across said inclined surface, into the recesses of said clamping portions.

4,440,426

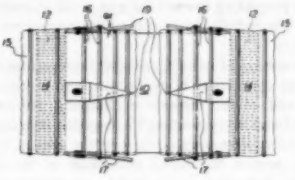
DUCT CONNECTOR

Karl Fahrion, 1000 Constance St., Pittsburgh, Pa. 15212

Continuation of Ser. No. 147,467, May 7, 1980, abandoned. This application Jan. 25, 1982, Ser. No. 342,349

Int. Cl.³ F16L 33/00

U.S. Cl. 285—239 6 Claims



1. Apparatus for connecting flexible duct to sheet metal components, said flexible duct having a flexible scrim material that is supported on a wire helix, said apparatus comprising:

a tubular sheet metal collar adapted on one end for longitudinal insertion into the flexible duct; and

piercing members having a first end connected to said collar adjacent the end thereof and having an apical end that is oppositely disposed from the one end of the collar, the apical ends of said piercing members being located on the outside of the scrim and the first end of said piercing members being located on the inside of the scrim with the wire helix being secured between piercing member and said collar, whereby a connection is made by forcing the flexible duct over the collar and then drawing the flexible duct in a direction such that the apical ends of the piercing members pierce the scrim.

4,440,427

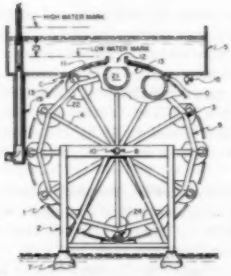
RESOURCE EFFICIENT WATER POWER PRIME MOVER

Willard B. Felton, 527 W. Orman Ave., Pueblo, Colo. 81003

Filed May 24, 1982, Ser. No. 381,416

Int. Cl.³ F05B 7/00

U.S. Cl. 290—54 6 Claims



1. In a water wheel type of power apparatus:

an arrangement of buckets suspended on pinion controlled pivots with the open portion facing upward in the normal pendent position;

each bucket located at the extremity of a spoke of the wheel with an idler pinion to engage a stationary rack at the bottom of the wheel;

a driven pinion attached to the bucket that is controlled by the rack and pinion at the bottom of the wheel;

an overlying water basin with a portion of its bottom contoured to engage in a water-tight mode the water wheel at the top;

an orifice in the water basin that allows the discharge of water only during the time a bucket is in place to be filled ;

a water seal that prevents the flow of water during the time that no bucket is present for filling;

a rack at the bottom of the wheel to engage the idler pinion and control the bucket through three-hundred-sixty degrees of rotation during the discharge cycle;

a frame supporting the wheel over a discharge basin for spent water control;

a coupling from the drive shaft of the water wheel to utilize the generated power.

4,440,428

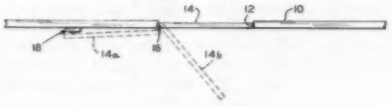
APPARATUS FOR DELAYING THE CLOSING OF A DOOR

Frank L. Jessup, 1023 Eastlawn Dr., New Whiteland, Ind. 46184, and Robert S. Kaiser, 11 McDonald Rd., Malboro, N.J. 07746

Filed Sep. 1, 1981, Ser. No. 298,498

Int. Cl.³ E05C 17/56

U.S. Cl. 292—251.5 6 Claims



1. Apparatus for holding a normally closed door open for a controlled period of time comprising in combination with a door movable between a closed first position and an open second position with the door normally biased toward the closed position,

means for holding said door in said second position,

means responsive to manual movement of said door to said second position for actuating said holding means,

timing means also responsive to manual movement of said door to said second position for initiating timing of the controlled period and at the expiration of the controlled period of time to disable the means for holding so that the door is released for movement to its first position.

4,440,429

BUMPER FOR A MOTOR VEHICLE, IN PARTICULAR A PASSENGER CAR

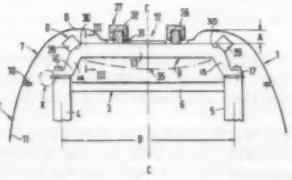
Wolfgang Eyb, Leonberg, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Oct. 16, 1981, Ser. No. 311,972

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039365

Int. Cl.³ B60R 19/08

U.S. Cl. 293—120 6 Claims



1. A shock absorbing bumper arrangement for a motor vehicle, in particular a passenger car, which comprises a cover made of an elastic material and a dimensionally stable beam, characterized by the fact that the beam is surrounded, at least in sections, by said cover and consists of fiberglass-reinforced plastic, said beam being fixed to body frame elements in the

manner of a beam at two locations located relatively far apart outside of a middle longitudinal plane of the vehicle,

the beam comprises a transverse part and supports which run approximately in the longitudinal direction of the vehicle and have ends which are designed to secure the beam, by means of attachment elements, to the body frame elements, and

the transverse part and the supports of the beam are unitarily constructed as a single piece.

4,440,430

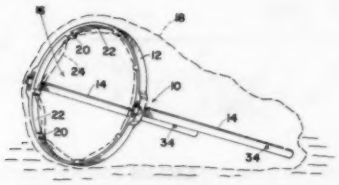
BAG OPENER

William A. Kruse, 129 Windsor Ave., Kensington, Calif. 94708

Filed Dec. 10, 1980, Ser. No. 215,104

Int. Cl.³ A47F *13/06*

U.S. Cl. 294—1 R **3 Claims**



1. A bag opener for a flexible bag, which comprises:

a ring-shaped portion dimensioned to fit inside a top of a bag, said ring-shaped portion being defined by an enclosed strip having sides extending normally to a plane defined by the ring-shaped portion, said ring-shaped portion having a plurality of apertures, each with a wall parallel to the sides of the enclosed strip, and a plurality of substantially straight leg portions extending through each of the apertures, being substantially normal to the plane defined by said ring-shaped portion and dimensioned to extend inside the bag to a point proximate to a bottom of the bag when said ring-shaped portion is inside the top of the bag, each of said leg portions having a top end extending around to form a clip with a side of the leg portion, the top end and side of the leg portion engaging the aperture wall and one of the strip sides to hold said leg portion in a fixed relationship relative to said ring portion.

4,440,431

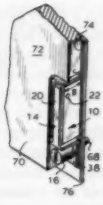
HANDLE AND FASTENING APPARATUS

Francisco A. Collurafici, Baltimore, and Ralph L. Lee, Rockville, both of Md., assignors to Fairchild Industries, Inc., Germantown, Md.

Filed Jan. 16, 1981, Ser. No. 225,681

Int. Cl.³ A47J *45/00*

U.S. Cl. 294—27 H **5 Claims**



1. Handle and fastening apparatus comprising a housing, a handle, said handle having a substantially L-shaped portion and an inner end portion, said handle having the inner end portion thereof rotatably connected to said housing to permit said handle to be pivoted from a stowed position to an operative extended position and the substantially L-shaped portion of said handle having portions thereof protruding outward away from the rest of said handle, and fastener means connected to one of the legs of the L-shaped outer end portion of said handle.

4,440,432

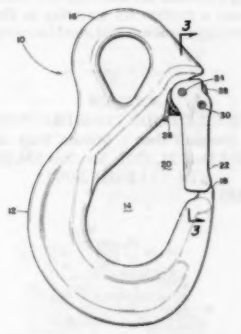
SELF-LOCKING, QUICK RELEASE, LATCHED HOOK

Hugo M. J. Goris, Boortmeerbeek, Belgium, assignor to The Crosby Group, Inc., Tulsa, Okla.

Filed Feb. 22, 1982, Ser. No. 350,862

Int. Cl.³ B66C *1/36*

U.S. Cl. 294—82 R **1 Claim**



1. A self-locking, quick release, latched, anti-fouling lifting hook comprising:

a substantially J-shaped body;

an attachment means located at the top end of said J-shaped body;

a point located at the other end of said body, thus defining the throat of said hook;

a rib projecting into the throat adjacent said top end, said rib including a locking ledge;

a spring loaded latch means, pivotally attached to said rib and held, under tension, for inward movement from a first position in contact with said point and thus closing said throat to a second position substantially straddling said rib;

a lever arm means pivotally attached to said latch means having a cog formed at one end thereof to be engageable with said locking ledge to prevent inward movement of said latch means, a spring normally biasing said lever arm means cog into said locking ledge, the other end of said lever arm means adaptable to be moved into the same said inward direction as the pivotal movement of said latch means from said first to said second position whereby, substantially simultaneously, said cog is released and said latch means moved.

4,440,433

AIR DEFLECTOR AND METHOD OF PROVIDING AIR DEFLECTOR

Wallace W. Williams, 42 E. Terrace St., and Eddie Williams, 3033 N. Glen St., both of Altadena, Calif. 91001

Filed Apr. 5, 1982, Ser. No. 365,746

Int. Cl.³ B62D *35/00*

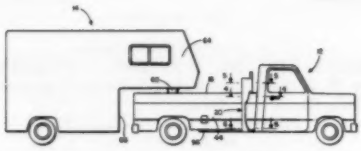
U.S. Cl. 296—15 **12 Claims**

1. An air deflector to mount on a first vehicle for towing a second vehicle, said first vehicle being provided with structure defining a substantially vertical opening, comprising:

side shield structure to extend outwardly and rearwardly outside a side wall of the first vehicle along said side wall,

said side shield structure having a front surface for deflecting air away from the vehicles and a rear surface; and

a mounting for said shield structure to mount said shield structure on the first vehicle, said mounting including a



post having a portion for securing said shield structure on said post and a portion for inserting in the substantially vertical opening to mount said shield structure on the first vehicle.

4,440,434

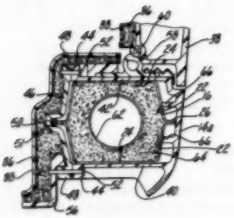
VEHICLE BODY CONSTRUCTION

Aldo Celli, Via Jacopo Palma 9, Milano, Italy 20146

Filed Dec. 24, 1981, Ser. No. 334,234

Int. Cl.³ B62D *29/04*

U.S. Cl. 296—185 **6 Claims**



1. A vehicle body of the type having a series of tubular structural members rigidly secured together to form a frame and a plurality of plastic panels overlying and secured to said structural members to provide the exterior of the body, each structural member comprising a pair of straight metal channel members each having a flat bottom wall and a pair of spaced side walls having laterally outwardly extending flanges along the longitudinal free edges thereof, each pair of channel members being arranged in opposed relation with their flanges juxtaposed and secured together to form the hollow structural member, said structural members being secured together in said frame with the secured flanges at one side of the structural member extending in a direction outwardly of the vehicle body and the opposite secured flanges extending in a direction inwardly of the vehicle body, the bottom walls of the channel members forming parallel side walls of the structural member which extend generally parallel to the secured flanges and in a direction transversely of the plane of the panels, each of said plastic panels having at least one pair of parallel spaced walls projecting from the inner face of the panel in a direction inwardly of the vehicle body, said pair of inwardly projecting walls and the portion of the panel extending therebetween straddling a portion of the structural member such that the inwardly projecting walls on the panel are in substantial coplanar engagement with the bottom walls of the structural member, said inwardly projecting walls having laterally outwardly extending flanges along their free edges spaced in a direction inwardly of the vehicle body from the inner face of the panel, the means for securing the panel to the structural member comprising an elongate adaptor cap straddling the side of the structural member facing inwardly of the vehicle body and having laterally outwardly extending flanges along opposed free edges thereof which are seated on and against the flanges at the edges of said inwardly projecting walls, the flanges of the adaptor cap and the flanges at the edges of said inwardly projecting walls having registering openings extending therethrough and blind rivets extending through said registering openings and securing the adaptor cap to the flanges of the inwardly projecting walls, said rivets being adapted to be inserted through said registering openings and crimped from the face of the adaptor cap which faces inwardly of the vehicle body, said adaptor cap engaging a portion of the structural member facing inwardly of the vehicle body and a portion of the panel between said inwardly projecting walls engaging a portion of the structural member facing outwardly of the vehicle body so as to rigidly secure the panel to the structural member.

4,440,435

MOTOR VEHICLE FRONT SECTION

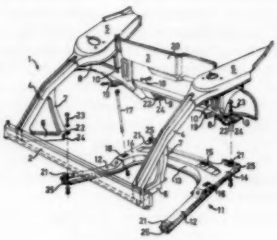
Stig I. Norlin, Kungshamn, Sweden, assignor to Saab-Scania Aktiebolag, Sweden

Filed Nov. 24, 1981, Ser. No. 324,627

Claims priority, application Sweden, Nov. 24, 1980, 8008208

Int. Cl.³ B60R *21/00*

U.S. Cl. 296—188 **21 Claims**



1. An impact absorbing front section in a motor vehicle, the front section comprising:

a front structure in the front section, the front structure being securable to the vehicle body,

a first vertical abutment surface in the front structure extending in a direction substantially transverse to the length of the vehicle

a subframe for carrying a drive unit of the vehicle,

a second vertical abutment surface in the subframe for cooperating with the first vertical abutment surface, the second vertical abutment surface extending substantially parallel to the first vertical abutment surface, and

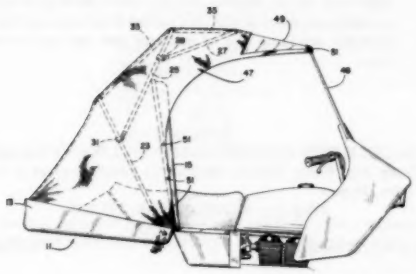
securing means for securing and positioning the subframe with respect to the front structure so that the first vertical abutment surface and the second vertical abutment surface are spaced a predetermined distance apart, and so that impact on the front of the vehicle drives the first vertical abutment surface and the second vertical abutment surface into contact, the subframe being positioned by the securing means so that the subframe serves to oppose collapse of the front structure under impact after the first vertical abutment surface and the second vertical abutment surface are driven into contact.

4,440,436

CONVERTIBLE TOP FOR MOTORCYCLES AND SNOWMOBILES

Marian S. Giddens, 311 W. Hermosa Dr., Fullerton, Calif. 92645, and Michael B. Arnold, P.O. Box 52428, Nairobi, Kenya

Filed May 6, 1982, Ser. No. 375,753
Int. Cl.³ B60J 7/00
U.S. Cl. 296—107 **7 Claims**



1. Apparatus providing a convertible canopy for single-seat vehicles comprising:

a pannier of substantially U-shaped cross-section curved to fit about the seat of a said vehicle and having apertures in the inner walls of the terminal ends thereof;

a plurality of rigid U-shaped frame members each sized to fit within said pannier, the first of said rigid U-shaped frame members having an aperture in each of its respective ends;

first attachment means attached to the respective ends of a second of said rigid U-shaped frame members for attaching said second frame member to said first frame member such that said second frame member may slide along said first frame member and pivot with respect thereto;

second attachment means attached to the respective ends of a third of said rigid U-shaped frame members for attaching said third frame member to said second frame member such that said third frame member may slide along said second frame member and pivot with respect thereto;

means insertable through the apertures in said pannier and in said first rigid U-shaped frame member for pivotably mounting said first frame member with respect to said pannier and for rigidly mounting said pannier with respect to said vehicle; and

canopy means for covering said plurality of rigid U-shaped frame members.

4,440,437

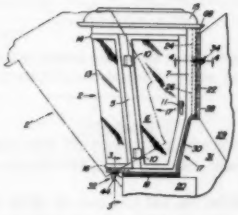
OPERATOR ENCLOSURE MOUNTING FOR A SELF-PROPELLED HARVESTER

Gunter Hahm, Kleinbundenbach; Klaus Pauli, Homburg-Einod, and Walter Schleicher, Swisttal, all of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed May 18, 1982, Ser. No. 379,414
Claims priority, application European Pat. Off., May 22, 1981, 81103938.7
Int. Cl.³ B62D 33/06
U.S. Cl. 296—190 **4 Claims**

1. In a self-propelled harvester having an operator station defined in part by harvester body structure portions including an approximately horizontal floor portion and a generally upright wall portion rearward and upward of and contiguous with the floor portion and including an operator enclosure having a frame and generally upright front and rear walls and opposite side walls and a downwardly and rearwardly facing bottom opening having a perimeter defined by lower portions of said walls and shaped to mate with tbe body floor and body upright wall portions so as to enclose the operator station, said enclosure rear wall extending above the body structure upright wall portion and adjacent a further body structure portion, a mounting arrangement for the enclosure comprising:

a plurality of spaced apart resilient mountings connecting the enclosure to the harvester body structure, including at least one rear mounting connected to a rearward upright portion of the enclosure and at least one forward mounting disposed adjacent a lower portion of the front wall, said forward mounting including means permitting forward pivoting of the operator enclosure about a horizontal lateral axis passing through said mounting so that the enclosure may be pivoted forward to expose the operator station; and



a mat-like insulating element carried by the body structure and interposed between the perimeter of the enclosure bottom opening and the harvester body structure for minimizing the noise and vibration transmitted into the operator station from the harvester body structure said element covering entirely the harvester body structure portions enclosed by the enclosure, and meeting and at least partially underlying substantially the entire perimeter of the enclosure bottom opening and sharing in the support of the enclosure.

4,440,438

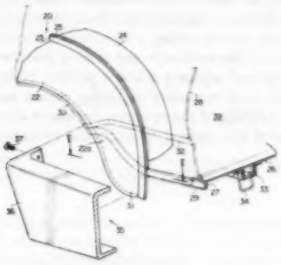
REAR VEHICLE BODY STRUCTURE OF AN AUTOMOTIVE VEHICLE

Takao Miyoshi, Yokosuka, and Sumio Inami, Atsugi, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 5, 1981, Ser. No. 308,679
Claims priority, application Japan, Oct. 31, 1980, 55-152261
Int. Cl.³ B62D 25/16
U.S. Cl. 296—195 **3 Claims**

1. A rear vehicle body structure of an automotive vehicle comprising: a pair of rear wheel houses each including a rear wheel house outer panel having a lower portion and a rear wheel house inner panel secured to the rear wheel house outer panel; a pair of rear fender panels each secured to the rear wheel house outer panel; and a rear floor panel having lateral ends and in part secured along each of its lateral ends to the rear wheel house inner panel; wherein said rear wheel house outer panel terminates below said rear fender panel and said rear floor panel, the rear wheel house outer panel projecting outwardly away from the lateral end of said rear floor panel and having a laterally outer portion curved in cross section toward the axis of rotation of said rear wheel, and wherein said rear fender panel has a rear lower end portion in part secured

to the lateral end of said rear floor panel projecting rearwardly from said rear wheel house, the rear lower end portion of said



rear fender panel in part extending across and secured to said lower portion of said rear wheel house outer panel.

4,440,439

CONVERTIBLE SEATS FOR TRANSPORT

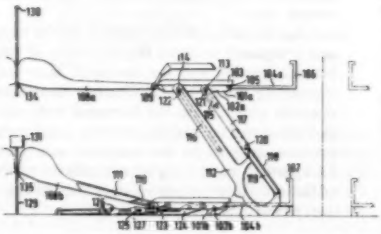
George S. A. Szabo, Gleinstrasse 2, 8000 München 80, Fed. Rep. of Germany

Continuation of Ser. No. 102,236, Dec. 10, 1979. This application Feb. 26, 1982, Ser. No. 352,772

Claims priority, application United Kingdom, Dec. 14, 1978, 48472/78

Int. Cl.³ A47C *13/00*

U.S. Cl. 297—62 **3 Claims**



1. A convertible seat unit comprising a first chair in combination with a second chair positioned in line with same wherein said first chair comprises in combination

(a) a first seat base having projections from the framework thereof,

(b) a first back rest movably mounted on the rear portion of said first seat base so as to be capable of being reclined from an erect, sitting position into a substantially horizontal, stretched berth position,

(c) a first leg rest, mounted at the front portion of said first seat base, and capable of being moved from an unobstructive position under said first seat base into a substantially horizontal berth position, and

(d) a first supporting means of retaining and locating said first seat base both in a sitting position and alternatively in an elevated berth position which comprises a base support member having parallel, upward stretching arms containing longitudinal channels which said projections engage in a slideable manner, and wherein said second chair comprises

(e) a second seat base,

(f) a second back rest movably mounted on the rear portion of said second seat base so as to be capable of being reclined from an erect, sitting position into a substantially horizontal, stretched berth position,

(g) a second leg rest, mounted at the front portion of said second seat base, and capable of being moved from an unobstructive position under said second seat base into a substantially horizontal berth position, and

(h) a second supporting means of retaining and locating said second seat base in a sitting position and alternatively in a horizontal berth position directly underneath said first chair when said first chair is in the elevated berth position, said supporting means comprising substantially parallel legs turnably mounted at one end on the floor and at the other end on said second seat base and a locking member turnably mounted at one end on the floor and capable of lockably engaging one of said legs and said second seat base.

4,440,440

SADDLE ROD FOR BICYCLES AND LIKE VEHICLES

Henry Juy, Dijon, France, assignor to Etablissements le Simplex, France

Filed Jun. 8, 1981, Ser. No. 271,200

Int. Cl.³ B62J *1/00*

U.S. Cl. 297—195 **6 Claims**

1. A saddle rod for bicycles and the like, comprising:

a saddle tube (1) having a spherical head (1*b*);

a head carriage unit having a lower element (3) forming a spherical cap (3*b*) which rests upon said spherical head, said head carriage unit encases the wires of a saddle frame;

a screw passing through said spherical head secures said head carriage unit to said saddle tube; and

said spherical head is provided with a vertical bore (1*c*) for said screw, having an hourglass shape with an approximate circular section at the center of said bore, the diameter of said circular section is slightly larger than the diameter of said screw passing therethrough, wherein said vertical bore is further provided with egg-shaped and flared sections at the periphery of the sphere in a lengthwise direction so that said screw can be angularly shifted and thereby said head carriage unit in the lengthwise direction only.

4,440,441

ENERGY ATTENUATING SEAT AND LEG THEREFOR

Ralph G. Marrujo, and Adrianus A. G. Cooper, both of Winston-Salem, N.C., assignors to Fairchild Industries, Inc., Germantown, Md.

Filed Dec. 17, 1981, Ser. No. 331,690

Int. Cl.³ B60R *21/10*

U.S. Cl. 297—216 **15 Claims**

1. A leg for a seat comprising two elongated spaced apart flange portions which are connected together at their respective ends which form a gap or space between at least a portion of the flange portions and means connected to at least one of said flange portions for increasing the loads which can be applied to said leg during elastic deformation of said leg, said

means for increasing loads which can be applied comprising means for a portion of one flange portion located on one side

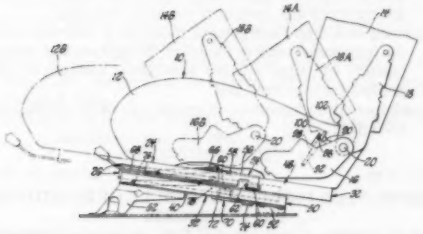
of the gap or space to exert a force upon the other adjacent flange portion located on the other side of the gap or space.

4,440,442

SEAT POSITION CONTROL MECHANISM

James R. Drouillard, Rochester, and Richard W. A. Rees, West Bloomfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 11, 1982, Ser. No. 347,689
Int. Cl.³ B60N 1/02, 1/04
U.S. Cl. 297—341 **3 Claims**



1. In a vehicle having a seat cushion and a seat back pivotally mounted to the seat cushion for forward tilting movement, a seat position control mechanism comprising,

laterally spaced inboard slave and outboard control track arrangements for mounting the seat on the vehicle for horizontal movement to a plurality of adjusted positions and movement from one location to an easy enter position and return to the one location, the inboard slave track arrangement including a single track assembly including a pair of slidable members, one mounted to the vehicle and the other mounted to the seat,

the outboard track control arrangement being comprised of an upper and a lower track assembly, one track member of each of the upper and the lower track assemblies being respectively mounted to the seat and to the vehicle and the other track members of the upper and lower track assemblies being secured to each other,

first latch means releasably locking the one track member of the upper track assembly to the other track member of such assembly at a plurality of locations defining the horizontal adjusted positions of the seat,

second latch means releasably locking the one track member of the lower track assembly to the other track member of such assembly at the one location,

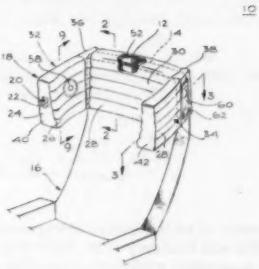
and means operated by tilting movement of the seat back for releasing the second latch means, said means including a fixed length cable member connected at one end thereof to the second latch means and connected at the other end thereof to the seat cushion, a sheath at least partially surrounding the cable member and having one end thereof fixed to the one track member of the lower track assembly and the other end thereof slidably mounted to the seat cushion, and means on the seat back engageable with means on the other end of the sheath upon tilting movement of the seat back for bending the sheath relative to the fixed one end thereof to thereby bend the cable member intermediate its ends and release the second latch means.

4,440,443

HEADREST

Robert A. Nordskog, 16000 Strathern St., Van Nuys, Calif. 91406

Filed Apr. 10, 1981, Ser. No. 252,938
Int. Cl.³ A47C 7/36
U.S. Cl. 297—397 **5 Claims**



1. A headrest adapted to be secured to the upper portion of an airplane seat backrest, comprising:

(a) a resilient body filled with an air-filled, flexible, foam material;

(b) said body, including a cavity therein disposed at the bottom and back thereof and adapted to be slipped over the top of a seat backrest;

(c) said body being so designed as to extend a minimal distance above said seat backrest when in its operative position;

(d) a pair of privacy wings secured to said body at the respective sides thereof;

(e) said privacy wings extending forwardly from and substantially perpendicular to said body to form a resting area for a person's head;

(f) said wings extending forwardly a sufficient distance to block off the side views of a person resting his head therebetween;

(g) said body having its central portion made of a relatively soft, resilient material and its end portions being made of a relatively rigid, resilient material;

(h) said wings being made of a relatively rigid, resilient material;

(i) a pair of speakers located in each of said wings and directed inwards to said resting area; and

(j) wherein said wings are pivotally secured to said body at the opposed ends thereof.

4,440,444

METHOD FOR CONTROLLING VOID IN AN IN SITU OIL SHALE RETORT

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jun. 15, 1981, Ser. No. 273,972
Int. Cl.³ E21C 41/10
U.S. Cl. 299—2 **45 Claims**

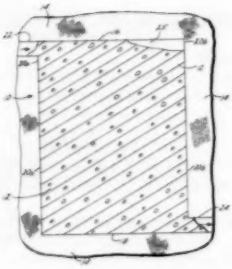
1. A method for forming an in situ oil shale retort in a retort

site in a subterranean formation containing oil shale, the in situ oil shale retort site having top, bottom, and side boundaries of unfragmented formation, comprising the steps of:

(a) excavating at least one void in the subterranean formation extending between the side boundaries of the retort site, leaving at least one zone of unfragmented formation within the boundaries of the retort site and having a horizontal free face adjacent such a void;

(b) explosively expanding such a zone of unfragmented formation toward the void for forming a fragmented permeable mass of formation particles in the in situ oil shale retort by:

(i) explosively expanding a first portion of the zone of unfragmented formation located between the horizontal



center of such a zone of unfragmented formation and a first side boundary of the retort site; and thereafter

(ii) sequentially explosively expanding remaining portions of the zone of unfragmented formation in a time delay sequence progressing away from the first portion of said zone of unfragmented formation;

(c) forming at least one retort inlet adjacent the intersection of the first side boundary of the retort site and the top boundary of the retort site for introduction of a retort inlet mixture; and

(d) forming at least one retort outlet adjacent the intersection of a second side boundary of the retort site and the bottom boundary of the retort site for withdrawal of off-gas, the second side boundary being on the opposite side of the retort site from the first side boundary.

4,440,445

FLUID OUTLET AT THE BOTTOM OF AN IN SITU OIL SHALE RETORT

Ned M. Hutchins, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 204,641, Nov. 6, 1980, abandoned. This application Nov. 30, 1981, Ser. No. 326,143

Int. Cl.³ E21C *41/10*

U.S. Cl. 299—2 **24 Claims**

1. A method for recovering liquid and gaseous products from an in situ oil shale retort in a subterranean formation containing oil shale, such an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale and having upper, lower, and side boundaries, comprising the steps of:

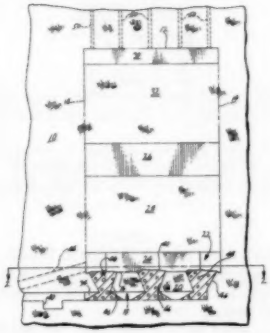
excavating formation from within the retort boundaries for forming a lower void extending generally horizontally across a lower level of the retort site, leaving a first zone of unfragmented formation within the retort boundaries above the lower void;

excavating formation from a production level spaced below the lower void for forming at least one production level drift, leaving a second zone of unfragmented formation between the lower void and the production level drift;

forming a plurality of product withdrawal passages through said second zone of unfragmented formation between the lower void and the production level drift for providing fluid communication between the fragmented mass in the retort and the production level drift, each of said product withdrawal passages containing a permeable mass of particles;

explosively expanding such first zone of unfragmented formation toward at least the lower void for forming a fragmented permeable mass of formation particles containing oil shale within the retort;

withdrawing the mass of particles from the product withdrawal passages;



establishing a retorting zone in an upper portion of the fragmented mass in the retort and advancing the retorting zone through the fragmented mass in the retort for producing liquid and gaseous products of retorting;

passing such liquid and gaseous products of retorting from the fragmented mass in the retort through each of such a plurality of empty product withdrawal passages to the production level drift; and

withdrawing such products of retorting from the production level drift.

4,440,446

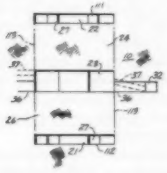
METHOD FOR FORMING A MODULE OF IN SITU OIL SHALE RETORTS

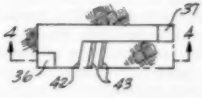
Ned M. Hutchins, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jan. 12, 1982, Ser. No. 338,896

Int. Cl.³ E21C *41/10*

U.S. Cl. 299—2 **17 Claims**





1. A method for forming a plurality of in situ oil shale retorts in a row of retort sites in a subterranean formation containing

oil shale, each such retort comprising top, bottom and side boundaries of unfragmented formation and containing a fragmented permeable mass of formation particles containing oil shale, comprising the steps of:

excavating a first drift at a higher elevation through the retort sites along a row of such retort sites;

excavating a second drift at a lower elevation through the retort sites along the row;

excavating an upper portion of a void in such a retort site, the upper portion extending substantially to the side boundaries and being at about the elevation of the first drift;

establishing communication between the upper portion of the void and the second drift for forming a generally vertically extending free face;

forming a plurality of generally vertically extending blastholes adjacent to the free face;

placing explosive charges in such blastholes;

detonating such explosive charges for explosively expanding formation between such blastholes and the free face toward the free face;

excavating the explosively expanded formation via the second drift for enlarging the void below the upper portion to about the elevation of the second drift and leaving a zone of unfragmented formation remaining in the retort site having a horizontally extending free face adjoining the void; and

explosively expanding at least a portion of the remaining zone of formation toward the void for forming a fragmented permeable mass of formation particles containing oil shale in the in situ oil shale retort.

4,440,447

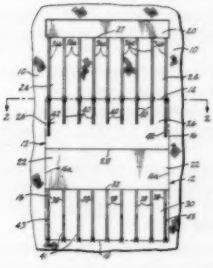
METHOD FOR FORMING AN IN SITU OIL SHALE RETORT WITH EXPLOSIVE EXPANSION TOWARDS A HORIZONTAL FREE FACE

Thomas E. Ricketts, and John E. Shaler, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 183,081, Sep. 2, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,687

Int. Cl.³ E21B *43/247*; E21C *41/10*

U.S. Cl. 299—2 **49 Claims**



1. A method for forming a fragmented permeable mass of formation particles in an in situ oil shale retort having top, bottom, and side boundaries of unfragmented formation in a retort site in a subterranean formation containing oil shale, the method comprising the steps of:

forming at least one void within the retort site in the subterranean formation, the void bounded by generally vertical side walls and zones of unfragmented formation above and below, the surface adjacent the void of at least one of such zones of unfragmented formation forming a substantially horizontal free face towards which such a zone of unfragmented formation is to be expanded;

forming an array of spaced apart explosive charges in the zone of unfragmented formation, the array of explosive charges comprising at least one central explosive charge spaced apart from the side boundaries and at least one outer explosive charge closer to an adjacent side boundary than such a central explosive charge the actual depth of burial of each such outer explosive charge being less than the actual depth of burial of each such central explosive charge, and the scaled depth of burial of each such outer explosive charge being not more than the scaled depth of burial of each such central explosive charge; and

detonating the array of explosive charges for explosively expanding the zone of unfragmented formation toward its substantially horizontal free face for forming a fragmented permeable mass of formation particles in the in situ oil shale retort.

4,440,448

METHOD FOR OPENING MINERAL DEPOSIT AND SUBSEQUENT MINING THEREOF

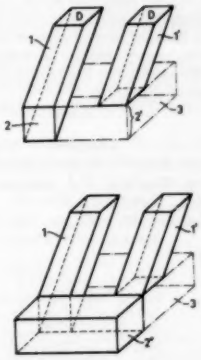
Gustav Hoberstorfer, 8 Vibblabyvägen, S-175 41 Järfälla, and Torsten Noren, 8 Svalnäs alle, S-182 63 Djursholm, both of Sweden

Filed Aug. 7, 1981, Ser. No. 291,048

Claims priority, application Sweden, Oct. 24, 1980, 8007489

Int. Cl.³ E21C *41/00*

U.S. Cl. 299—11 **12 Claims**



1. A method for opening a mineral deposit and subsequent mining of mineral rock including refilling with solid stabilizing filling materials and obtaining necessary and desirable stabilization by addition of binding agents or other reinforcement, a development required for the mining being positioned at least substantially entirely in the mineral rock, comprising the steps of driving inclined access and service ramps in one of an upward and a downward direction, establishing artificial access and service ramp systems in the stabilizing filling material, alternately utilizing the ramp systems such that within the range of at least two ramp systems, one ramp system, which at a given occasion is blocked by the mining of an ore slab from the one ramp system and cannot serve as a continuous communication link, is utilized along its entire distance except for the blocking point proper by alternating use between the one ramp system and another ramp system within the range.

4,440,449

MOLDING PILLARS IN UNDERGROUND MINING OF OIL SHALE

William A. Sweeney, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 5, 1982, Ser. No. 346,185

Int. Cl.³ E21C *41/10*

U.S. Cl. 299—11 **4 Claims**

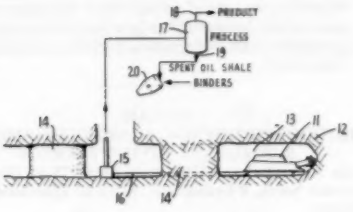
1. In a process for underground mining of a subsurface

deposit of oil shale wherein the deposit is mined and removed so as to form an underground cavity having a multiplicity of spaced unmined pillars that provide support for the roof of the cavity, the improvement comprising:

(a) assembling a mold in a space between unmined pillars;

(b) filling the mold with a fluid cementitious composition comprising

(i) 45% to 94% by weight of shale having a residual carbon content less than about one percent by weight and



20% to 35% by weight of its Mg, Ca, and Fe carbonates decomposed to the corresponding oxides,

(ii) 1% to 20% by weight of a binder, and

(iii) 5% to 50% by weight of water to form a body of said composition that extends vertically from the floor of the cavity to the roof thereof between the pillars;

(c) allowing the body to harden whereby a support member is formed for supporting the roof of the cavity; and

(d) disassembling the mold.

4,440,450

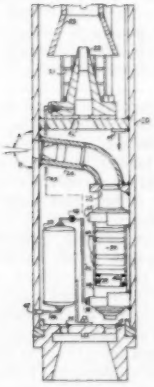
BOREHOLE MINING VALVE ACTUATION

John E. Coakley, Westfield, N.J., assignor to Slurry Mining Engineering Inc., Westfield, N.J.

Filed Aug. 18, 1982, Ser. No. 409,060

Int. Cl.³ E21C *45/00*

U.S. Cl. 299—17 **22 Claims**



1. An apparatus for actuating downhole flow control valves of a borehole mining tool with a power cylinder having a piston actuated by the fluid supply pressure to the tool comprising:

(a) a double-acting power cylinder with a piston within the cylinder and piston rods attached thereto and extending through the ends of the cylinder to operate valve plugs for the drilling water flow valve and for the mining water flow valve, the piston having hydraulic system pressure on one side and pneumatic or gas pressure on the opposite side, the power cylinder having a port at each end of the cylinder communicating with the pneumatic side or the hydraulic side of the piston;

(b) pneumatic or gas pressure within the cylinder on one side of the piston capable of holding the piston at the opposite end when subjecting the hydraulic side of the piston to drilling system pressure;

(c) the pneumatic side port sealed to retain the air or gas within the cylinder:

(d) a piston stop within the pneumatic side of the piston to stop the movement of the piston after a change of valve position;

(e) means of increasing the fluid supply pressure to the mining system pressure and applying the pressure to the hydraulic port side of the power cylinder which forces the piston opposed by the pneumatic pressure on the opposite side of the piston against the stop with the piston rod extensions to the valves closing the drilling port and opening the mining port valve.

4,440,451

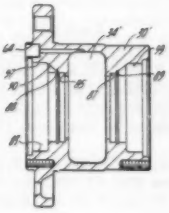
VEHICLE HUB WITH BEARING REMOVABLE FEATURE

Fred L. Goodell, Grosse Ilse, and Michael J. Ellison, Canton, both of Mich., assignors to AM General Corp., Detroit, Mich.

Division of Ser. No. 311,855, Oct. 16, 1981, which is a continuation-in-part of Ser. No. 288,834, Jul. 31, 1981, Pat. No. 4,418,737. This application Sep. 28, 1982, Ser. No. 425,756

Int. Cl.³ B60B *27/00*

U.S. Cl. 301—105 R **6 Claims**



1. A hub for vehicle comprising:

an annular member having an inner peripheral surface with at least one portion thereof adapted to receive a bearing assembly;

a plurality of spaced ramps formed in said surface interiorly of bearing receiving portion; and

sealing ring receiving means formed in the inner surface of the hub for holding a sealing ring, with the ramps radially extending outwardly from the sealing ring receiving means to the bearing receiving portion;

whereby said bearings may be removed by a device adapted to contact interior portions of the bearing assembly through said ramps.

4,440,452

HYDRAULIC BRAKE SYSTEM FOR TWO-WHEELED VEHICLES

Manfred Burckhardt, Waiblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 333,978

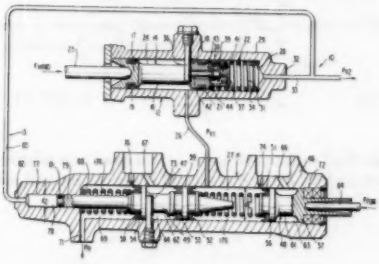
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049108

Int. Cl.³ B60T *8/26, 11/20*

U.S. Cl. 303—6 A **21 Claims**

1. A hydraulic braking system for two-wheeled vehicles, the braking system including a first main brake cylinder means connected with a rear axle braking circuit, means for actuating the first main brake cylinder means, a second main brake cylin-

der means connected with a front axle braking circuit, means for actuating the second main brake cylinder means, means for distributing a brake force in a predetermined ratio when the first main brake cylinder means is actuated so as to produce a pressurization of both the front axle and rear axle braking circuits and to reduce the pressure in the rear axle braking circuit when the second main brake cylinder is simultaneously actuated with the first main brake cylinder, characterized in that the first main brake cylinder means includes a tandem main brake cylinder having a primary pressure chamber means forming an output pressure chamber means for the front axle braking circuit, an axially displaceably mounted primary and secondary piston means axially delimiting the primary pressure chamber means, a second pressure chamber means axially delimited by the secondary piston means and an inner wall of a housing of the first main brake cylinder means forming an



output pressure chamber for the rear axle braking circuit, the second main brake cylinder means includes an output pressure chamber means, a displaceably mounted piston means for delimiting an annular pre-pressure chamber means, means for communicating the annular pre-pressure chamber means with the output pressure chamber means of the second main brake cylinder means when the piston means of the second main brake cylinder means is in a rest position, means are provided for pressure tight sealing off communication between the pre-pressure chamber means and the output pressure chamber means of the second main brake cylinder means after a displacement of the piston means of the second main brake cylinder means a small fraction of a working stroke, and in that feedback means are provided for exerting a restoring force proportional to a front axle braking pressure on the secondary piston means of the tandem main brake cylinder.

4,440,453

HYDRAULIC SYSTEM FOR A VEHICLE

Yoshiharu Adachi, Gamagori, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 24, 1982, Ser. No. 361,375

Claims priority, application Japan, Mar. 31, 1981, 56-49011

Int. Cl.³ B60T *13/16*

U.S. Cl. 303—50 **6 Claims**

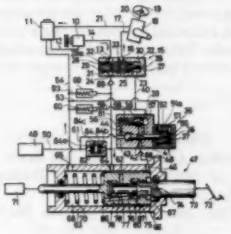
1. A hydraulic system for automotive vehicles comprising,

a flow divider valve means for dividing a fluid flow from a single fluid flow supply source into a regulated portion and a remaining portion,

a fluid storage means in communication with said single fluid flow supply source for changing a fluid therein,

an unloader valve means for interrupting fluid flow of said regulated portion passing therethrough in response to fluid pressure in said fluid storage means,

a hydraulic brake booster having a power piston dividing the interior of said booster into a pressure chamber in communication with said fluid flow from said flow divider and a drain chamber communicating with a reservoir and being provided with open-center valve means for controlling fluid flow from said pressure chamber into said drain chamber upon a manual actuation and a normally closed valve means for permitting communication between said pressure chamber and said fluid storage means upon an extension of said manual actuation subsequently to closure of said open-center valve means, and



a bypass valve means for permitting a fluid flow of said regulated portion to bypass said unloader valve means in response to fluid pressure in fluid flow of said regulated portion upstream of said unloader valve means and downstream of said flow divider.

4,440,454

PRESSURE CONTROL ARRANGEMENT FOR VEHICLE BRAKING SYSTEM WITH ANTISKID CONTROL EQUIPMENT

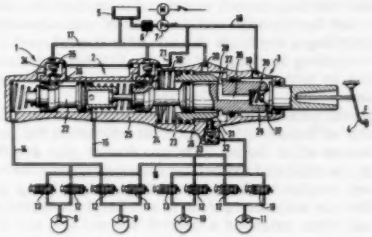
Juan Belart, Walldorf; Jochen Burgdorf, Neugasse; Dieter Kircher, Frankfurt am Main, and Lutz Weise, Mainz, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 28, 1981, Ser. No. 316,012

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040540

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—114 **17 Claims**



1. An arrangement for controlling the pressure of a hydraulic braking fluid supplied to wheel brake actuating cylinders interposed between supply and return conduits of a vehicle braking system provided with antiskid control equipment and with a supply reservoir in dependence on the position of a brake pedal, comprising a master cylinder device including a housing defining an elongated bore, and at least one master piston received in said bore for longitudinal movement in and opposite to a working direction and delimiting in said bore a working compartment for the hydraulic braking fluid that communicates with at least one of the supply conduits; means for transmitting the brake pedal force to said master piston to move the same in said working direction and thus to pressurize the hydraulic braking fluid present in said working compartment; an auxiliary source of a pressurized hydraulic braking fluid, means for admitting the pressurized hydraulic braking fluid from said auxiliary source into said working compartment only during antiskid control operation of the antiskid control equipment, including a circulating conduit for pressurized

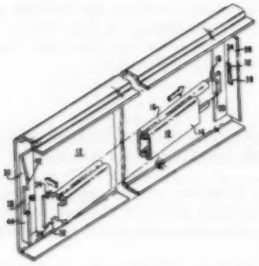
fluid; and means for controlling the pressure in said circulating conduit, and a throttling valve interposed at the output of said circulating conduit and arranged between said brake pedal and said master piston to constitute at least a part of said transmitting means, and said throttling valve responsive to pressurized fluid from said circulating conduit for permitting flow from said circulating conduit only after the pressure in said circulating conduit has exceeded a value having a predetermined ratio to the brake pedal force to provide pressurized fluid from said admitting conduit to said working compartment.

4,440,455

DRAWER GLIDE MOUNT

Richard J. Lanting, Grand Rapids, and Bruce A. Rentz, Kentwood, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 3, 1982, Ser. No. 384,702
Int. Cl.³ F16C *29/00*
U.S. Cl. 308—3.8 **4 Claims**



1. A drawer glide mount for mounting a drawer glide to the interior surface of drawer casing side wall, said drawer glide mount comprising;

front and rear mounting tabs secured to the interior surface of the side wall of said drawer casing adjacent the front and rear ends thereof, one of said mounting tabs including a slot therethrough and the other of said mounting tabs including a keyslot in the side edge thereof, said keyslot comprising an elongated slot of a first vertical dimension and an entrance opening of a lesser vertical dimension, and

a drawer glide having a planar extension on one end thereof and an extension having cutout notches in the top and bottom edges thereof forming a drawer glide key therein on the other end thereof, the distance between the base of said notches in the top and bottom edges being greater than the entrance opening in said keyslot whereby when said planar extension is inserted into said slot, said drawer glide key must be rotated into said keyslot for locking engagement with said front and rear mounting tabs.

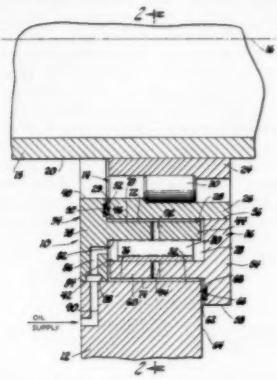
4,440,456

SQUEEZE FILM BEARING MOUNT

Steven A. Klusman, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1983, Ser. No. 478,247
Int. Cl.³ F16C *27/00*
U.S. Cl. 308—184 R **3 Claims**

1. In a shaft bearing mount in an annulus between a cylindrical bore in a support structure and a concentric cylindrical surface of a shaft bearing outer race, the combination comprising, a first adapter rigidly attached to said support structure having a cylindrical flange projecting into said annulus with an inner surface thereof cooperating with said bearing race outer surface in defining an inner squeeze film annulus, a second adapter rigidly attached to said outer race having a cylindrical flange projecting into said annulus radially outboard of said first adapter cylindrical flange with an outer surface of said second adapter flange cooperating with said bore in defining an outer squeeze film annulus, and means for maintaining each of said inner and said outer squeeze film annuli filled with



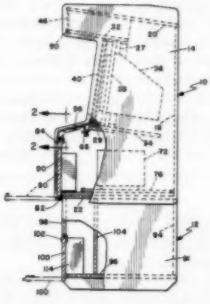
hydraulic fluid so that oscillations of said outer race relative to said bore are fluid damped at each of said inner and said outer squeeze film annuli.

4,440,457

UNIVERSAL ELECTRONIC VIDEO GAME CABINET

H. Frank Fogelman, and Arnum Ambrose, both of San Diego, Calif., assignors to Sega Electronics, Inc., San Diego, Calif.

Filed Oct. 13, 1981, Ser. No. 310,520
Int. Cl.³ A47B *81/06*
U.S. Cl. 312—7.2 **14 Claims**



1. A universal convertible electronic video game cabinet, said cabinet comprising:

front panel means, side panel means, and back panel means arranged and interconnected to define an upstanding box-like enclosure,

partition means separating the interior of said cabinet into an exclusive electronics compartment and an exclusive coin compartment,

said front panel means including an opening defined by a video mounting frame for mounting a video monitor with the video screen at a level for viewing from a standing position,

a control panel for mounting manually manipulable control means detachably mounted by releasable latch means below and forward of said video mounting opening,

a first access opening for providing restricted access solely

to electronics components in said electronics compartment, and

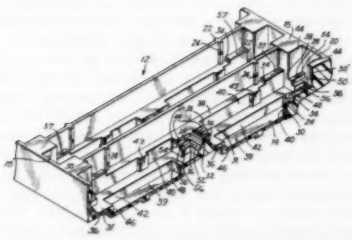
a second access opening in said front panel secured by second lockable closure means for providing restricted access solely to said coin compartment.

4,440,458

HOLDER FOR VIDEO GAME AND COMPUTER CARTRIDGES, VIDEO FILM CARTRIDGES, AUDIO/VIDEO CASSETTES AND THEIR STORAGE CASES

Joseph L. Berkman, Mamaroneck, N.Y., assignor to Berkman Industries, Inc., Boynton Beach, Fla.

Filed Feb. 11, 1982, Ser. No. 348,149
Int. Cl.³ A47B 81/06
U.S. Cl. 312—9 24 Claims



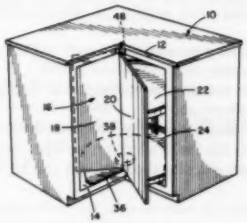
1. A storage unit or holder having at least one bin for video cassettes and video game/computer cartridges, wherein the bin is capable of interchangeable receiving and storing a plurality of differently sized video cassettes, video film cartridges and differently sized video game/computer cartridges each said bin comprising a generally rectangular configuration bounded by a bottom wall (14), side wall surfaces (22,24), and end walls (18, 20), another bottom wall surface (30) projecting from and being disposed above said bottom wall (14) and on both sides of each bin transversely extending substantially for the width of said bin, and terminating generally at second end surface walls (34) extending upwardly from said another bottom wall surface (30); additional side surface walls (40), projecting from said side wall surfaces (22,24), and extending on one side from said bottom wall (14) to said another bottom wall surface (30) and on the other side from said another bottom wall surface (30), to a further bottom wall surface (31) projecting from and being disposed above said bottom wall (14) and residing between the bottom wall (14) and said another bottom wall surface (30); additional end surface walls (36) projecting from said end wall (18,20) and extending from said further bottom wall surface (31) to additional bottom surface walls (50); and at least one channel-shaped side wall surfaces (42, 46, 48) extending upwardly from said bottom wall (14) to said further bottom wall surface (31); other bottom surface walls (28) projecting from said bottom wall surface (31) and being disposed between said additional bottom surface walls (50) and short bottom surface walls (57) above said another bottom wall surface (30); and secondary side surface walls and secondary end surface walls; wherein each bin can securely hold in place between cooperatively associated walls one video cassette of either Beta or VHS configuration, or two video film or game/computer cartridges of either the same or different configurations.

4,440,459

ROTATABLE SHELF HARDWARE

Charles G. Hallgren, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed May 7, 1982, Ser. No. 376,183
Int. Cl.³ A47B 49/00, 57/00
U.S. Cl. 312—238 6 Claims



1. Hardware for a rotary shelf unit comprising, in combination:

an upper bracket assembly for pivotally attaching a cabinet door to a cabinet housing to pivot about a vertical axis;

a lower support assembly for attachment to a bottom horizontal shelf affixed to the cabinet door for pivotally supporting the cabinet door about the vertical axis, said lower support assembly including:

a mounting plate for affixing to the floor of a cabinet;

a hub adjustably attached to the mounting plate;

a hub receptacle for attachment to the bottom shelf and for receipt of the hub;

said hub including a laterally outward, biased follower member, and said hub receptacle including at least one detent for cooperation with the follower member;

said biased follower member comprising a coil spring interposed between first and second roller carriages, said carriages mounted for reciprocal movement in a radial slot in the hub, each of said carriages including a roller member rotatable about an axis parallel to the vertical axis; and

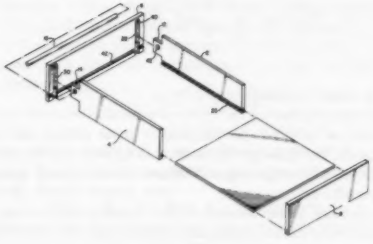
roller means spacing the bottom shelf and mounting plate.

4,440,460

FURNITURE AND DRAWER THEREFOR

John C. Brighoff, 2712 Sams Creek Rd., New Windsor, Md. 21776

Filed Aug. 6, 1981, Ser. No. 290,721
Int. Cl.³ A47B 95/02
U.S. Cl. 312—320 15 Claims



1. A drawer for an article of furniture comprising:

a wooden front member having two rectangular mortise apertures therethrough adjacent but spaced inwards of the side edges thereof, said mortise apertures being parallel to each other and being vertically disposed;

a pair of parallel wooden side members each having integral

therewith a tenon extending forwardly at the forward end thereof, each said tenon being firmly inserted through and protruding forwardly beyond a respective one of said mortise apertures, said front member being secured to said pair of side members by the two mortise and tenon joints thereby made;

a rod connected to the portions of said tenons protruding forwardly beyond said front member, and extending parallel to said front member in spaced relationship therefrom;

a back member connected at its ends to the rear ends of said side members;

a bottom of the drawer connected to said front, side and back members; and

said rod forming a handle by which the drawer can be pulled open with the force necessary to open the drawer being transmitted directly through said rod to said side members;

whereby said side members are the main structural members of the drawer, and in use failure of the joints between said wooden front member and said wooden side members is mitigated by said rod handle being connected to said tenons of said side members.

4,440,461

SLIDE ARRANGEMENT

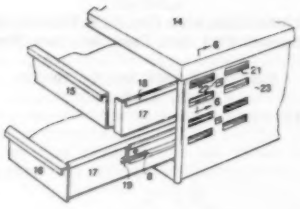
George G. Powell, and Reece J. Powell, both of Broadford, Australia, assignors to Sinclair & Powell Proprietary Limited, Victoria, Australia

PCT No. PCT/AU80/00045, § 371 Date Apr. 6, 1981, § 102(e) Date Apr. 6, 1981, PCT Pub. No. WO81/00349, PCT Pub. Date Feb. 19, 1981

PCT Filed Aug. 7, 1980, Ser. No. 253,856

Int. Cl.³ A47B *88/00*

U.S. Cl. 312—330 R **5 Claims**



1. A metal receptacle comprising

(a) a housing having two generally parallel internal surfaces, each of which is provided with guide means, said guide means being integrally formed in at least one of said surfaces and comprising at least one pair of spaced, generally parallel ridges;

(b) drawer means located in the housing and having two generally parallel external surfaces each of which is adjacent one of said internal surfaces;

(c) floating slide means communicating between respective pairs of said internal and external surfaces to facilitate sliding movement of the drawer means into and out of the housing, said slide means having a first portion engaging the guide means and a second portion engaging said drawer means.

4,440,462

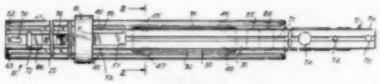
SELF-ALIGNING DRAWER AND SLIDE BRACKET ARRANGEMENT THEREFOR AND ASSOCIATED METHOD

Morris Manson, Nine Terrace Dr., Drive Neck, N.Y. 11021

Filed Oct. 26, 1981, Ser. No. 314,889

Int. Cl.³ A47B *88/00*; F16C *21/00*

U.S. Cl. 312—348 **6 Claims**



1. An article of manufacture comprising a case member, a drawer slidably mountable in said case member, and a telescopic slide means coupled between said drawer and said case member and engaging the drawer for sliding displacement relative to said case member, said telescopic slide means including at least one telescopic member having at least one loose engagement with said drawer to permit limited displacement between said one telescopic member and drawer and thereby a self alignment of said drawer relative to said case member, said drawer being provided with an opening and said telescopic member protruding into said opening and having a loose fit therein to permit said limited displacement, said drawer including front and rear parts and the first said telescopic member extending along the outside of said drawer between said front and rear parts, said opening being provided in one of said parts, the first said telescopic member including a first end portion extending with loose fit into said opening and a second end portion adjacent the rear part of the drawer, said article further including connecting means connecting said second end portion to the rear part of the drawer, said telescopic slide means including a second telescopic member mounted on said case member and telescopically coupled with the first said telescopic member, said opening being a blind bore opening, said opening including a jog of increased dimensions at the entry into said opening, said article further including a guide means located at least partly in said jog to engage and guide displacement of said first end portion and to retain the latter in said opening.

4,440,463

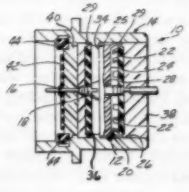
ELECTRICAL CONNECTOR HAVING A METALLIZED PLASTIC GROUNDING INSERT

Edward R. Gliha, Jr., Bainbridge, and Christopher Marks, Guilford, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 26, 1981, Ser. No. 314,901

Int. Cl.³ H01R *4/66*

U.S. Cl. 339—14 R **10 Claims**



1. In combination with an electrical connector of the type having a plated plastic grounding insert, said connector including a generally cylindrical connector shell, having a bore formed therein at least one contact mounted in said shell having a grounding electrode to be grounded to said shell and a grounding insert electrically connecting said electrode of said at least one contact to said connector shell said grounding insert consisting of a disc portion, and a series of integral spring

fins disposed about the periphery of said disc portion, trailing from the rear face thereof and inclined radially outwardly, said spring fins being compressibly received in said bore formed in said shell; said insert further being formed with at least one opening extending through said disc portion corresponding to each of said at least one contact and each located to receive said contact with said grounding electrode and each having an integral generally conical grounding tower surrounding each of said at least one opening and adapted to grip said electrode of said at least one contact passing therethrough, the improvement wherein said grounding insert is comprised of a molded plastic member having a conductive surface layer integrally applied thereto to completely cover the member.

4,440,464

COAXIAL HF PLUG CONNECTOR HAVING ALTERNATE CONNECTING MEANS

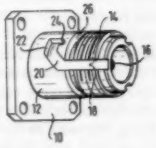
Georg Spinner, Am Eichberg 12, D-8152 Feldkirchen-Westerham 1, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 272,056

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3022102

Int. Cl.³ H01R *13/625*

U.S. Cl. 339—33 **5 Claims**



1. A coaxial HF plug connector including a coupler and a plug, characterized by the fact that the coupler includes a sleeve which is provided with external screw threads and bayonet paths, said bayonet paths extending at least in part through the external screw threads whereby said coupler may accommodate a plug having either internal threads or bayonet projections.

4,440,465

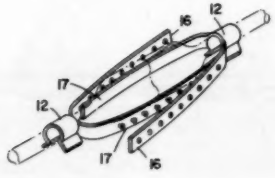
ELECTRICAL PLUG CONNECTOR LOCK

James M. Elliott, 3163 Coolidge Ave., Oakland, Calif. 94602; Eric A. Rickel, and Terri F. Rickel, both of 18018 Lazy Dog Rd., Nevada City, Calif. 95959

Filed Apr. 6, 1981, Ser. No. 251,325

Int. Cl.³ H01R *13/62*; A44B *13/00*

U.S. Cl. 339—75 P **4 Claims**



1. A locking assembly for retaining together a pair of mutually engaging plug connectors extending from separate cable members, comprising; a pair of substantially identical locking members, each locking member including a collar portion adapted to engage one of said cable portions adjacent to the base of the respective plug connector, each collar portion including means for releasably engaging said cable portion, said means comprising a tubular member having a bore extending therethrough and dimensioned to receive said cable portion therein, and a slot extending longitudinally through said tubular member, said slot being narrower than the diameter of said cable portion and adapted to admit or release said cable portion in resiliently engaging fashion; a pair of arms extending longitudinally from each of said collar members toward the other collar member; and means on each of said pair of arms for mutual engagement with the arms of the other locking member to join said locking members in fixed longitudinal relationship.

4,440,466

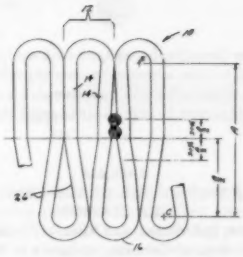
WIRE CONNECTOR

Karl-Heinz Phol, Woodbury, Conn., assignor to The Siemon Company, Watertown, Conn.

Filed Jun. 8, 1981, Ser. No. 271,603

Int. Cl.³ H01R *11/22*

U.S. Cl. 339—97 P **5 Claims**



1. A multiple terminal solderless electrical connector comprising:

a discrete number of interconnected loops, said loops being formed from a continuous piece of conductive resilient material, said loops from being arranged in a co-planar relationship between two end loops, said loops each having two straight parallel side portions connected by a semi-circular portion, said straight side portions of adjacent of said loops being in an abutting relationship, at least all of those loops intermediate the end loops having non-parallel extensions of said straight side portions, said extensions each having an arcuate section which connects with an arcuate section of an extension of an adjacent loop whereby said extensions interconnect the abutting side portions of adjacent loops through open loops between each pair of said extensions, the length of each of said extensions being greater than the radius of said connected arcuate sections, the length of said straight parallel side portions being at least approximately half the distance (A) between a pair of parallel lines extending respectively through the centers of said loop semi-circular portions and said connected arcuate sections of said side portion extensions in a direction perpendicular to said straight side portions.

4,440,467

BULB SOCKET AND COVER ASSEMBLY

Armando Vologni, and Giorgio Vologni, both of Via Bizet no 2 - 42100, Reggio Emilia, Italy

Filed May 20, 1982, Ser. No. 380,378

Claims priority, application Italy, May 29, 1981, 34853/81[U]

Int. Cl.³ H01R *13/00*

U.S. Cl. 339—154 L **3 Claims**

1. A bulb socket assembly comprising a cylindrical base member having external threads thereon adapted to mate with the threads of a standard light bulb socket, a hollow tubular socket extending coaxially from one end of said base member and having a diameter substantially less than the diameter of

said cylindrical base member, said hollow tubular socket having external threads thereon, an apertured cover support disc surrounding said hollow tubular socket, an internally threaded

sleeve member threadingly engaged with said external threads on said hollow tubular member for securing said cover support disc in engagement with said base member and cover means detachably connected to said cover support disc.

4,440,468

PLANAR WAVEGUIDE BRAGG LENS AND ITS UTILIZATION

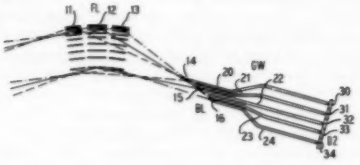
Franz Auracher, Baierbrunn, and Michael Stockmann, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 25, 1981, Ser. No. 296,134

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3035849

Int. Cl.³ G02B *5/174*

U.S. Cl. 350—96.12 **13 Claims**



10. In a planar optical component utilizing a planar waveguide Bragg lens and a plurality of detector elements, the improvement comprising the planar waveguide Bragg lens being off-axis with a high deflection efficiency for light of various angles of incidence, said lens comprising a plurality of grating structures arranged in series and each grating structure having grating elements being inclined relatively towards the elements of other structures at varying angles so that the range of the angle of incidence of the individual grating structures overlap and light from various point sources can be imaged with approximately equal quality by said lens, and said component includes waveguides extending between a plane of focal points for the Bragg lens and the detector elements.

4,440,469

OPTICAL WAVEGUIDE CONNECTOR

William L. Schumacher, Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 18, 1980, Ser. No. 188,395

Int. Cl.³ G02B *7/26*

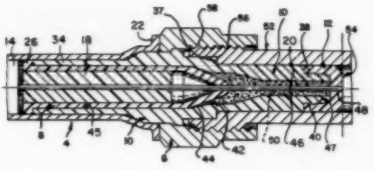
U.S. Cl. 350—96.20 **9 Claims**

1. An optical waveguide connector for connecting to an optical fiber of an optical waveguide member and for connection within a coupling member, comprising:

contact body means having a forward section and a rear section, said contact body means having profiled passageway means extending therethrough, said profiled passageway means having a smaller diameter in said forward section, said profiled passageway means in said rear section adapted to receive an inner jacket surrounding the optical fiber and said smaller diameter profiled passageway means in said forward section receiving the optical fiber therein;

said forward section having a forward end of smaller outer diameter than the outer diameter of said forward section;

resilient and radially compressible alignment ferrule means



having a centrally disposed aperture therethrough for closely receiving an end of the optical fiber therein with a forward end surface of the optical fiber located coplanar with a forward surface of said alignment ferrule means, said alignment ferrule means having a counterbore rearward of said aperture engaging said forward end of said forward section, the outer diameter of said alignment ferrule means being the same as the outer diameter of said forward section so that said forward section with said alignment ferrule means thereon is positionable within the coupling member with the alignment ferrule means resiliently engaging the coupling member thereby compressibly engaging the optical fiber end disposed in said aperture and aligning the axis of the optical fiber with the axis of the coupling member.

4,440,470

OPTICAL TRANSMISSION SYSTEM COUPLING A SEMICONDUCTOR LASER DIODE TO A MULTIMODE OPTICAL FIBER

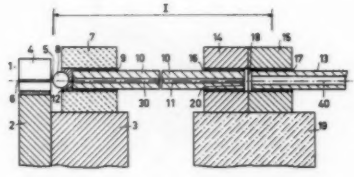
Giok D. Khoe, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,756

Claims priority, application Netherlands, Sep. 12, 1980, 8005134

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.20 **6 Claims**



1. An optical transmission system comprising:

a semiconductor laser for generating light having a coherence length;

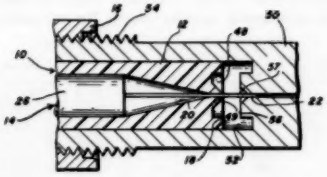
a multimode transmission fiber; and

a monomode fiber providing a coupling path for guiding light from the laser to the transmission fiber, said monomode fiber having a length greater than the coherence length of the laser light in the monomode fiber.

4,440,471
FIBER OPTIC CONNECTORS

Robert G. Knowles, Litchfield, Conn., assignor to Litton Systems, Inc., Watertown, Conn.

Filed Nov. 9, 1981, Ser. No. 319,438
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 8 Claims



1. A fiber optic connector having at least one optic terminal comprising

a hollow cylindrical ferrule having a terminal face on one end,

an axial bore through said terminal face communicating with the interior of said ferrule, said axial bore being dimensioned slightly larger than an optic fiber of a selected fiber optic cable,

one end of said selected fiber optic cable disposed within said ferrule having its optic fiber located within said axial bore,

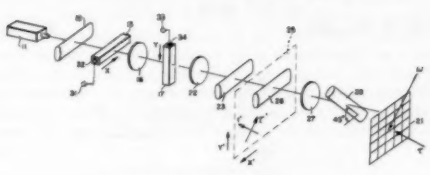
a circular groove in said ferrule face defining an annular central portion concentric with said ferrule axis, and

said annular central portion sloping towards the center of said terminal face into engagement with said optic fiber so as to define a constricted portion of said axial bore at said terminal face.

4,440,472
SPACE INTEGRATING AMBIGUITY PROCESSOR

Jonathan D. Cohen, Severn, Md., assignor to The United States of America as represented by the Director of National Security Agency, Washington, D.C.

Filed Apr. 24, 1981, Ser. No. 257,061
Int. Cl.³ G02B 5/18; G06G 9/00; G01S 13/58
U.S. Cl. 350—162.12 5 Claims



1. A two-dimensional optical processor, comprising:

means for providing a coherent light beam;

a two-dimensional detector;

means for modulating the light beam in a first spatial dimension, x, said x-modulating means including a first one-dimensional spatial light modulator to which is provided a first modulating signal;

means for expanding the x-modulated beam in a second, mutually orthogonal spatial dimension, y;

means for modulating said expanded x-modulated beam in the second spatial dimension, said y-modulating means including a second one-dimensional spatial light modulator to which is provided a second modulating signal;

optical means for focusing the twice-modulated light beam at a plane perpendicular to the beam such that position in one direction t′ on the plane corresponds to time delay in both modulating signals and position in a perpendicular direction τ′ on the plane corresponds to relative time delay between the modulating signals;

optical means in said plane for matching the phase of the modulating signals within said focused beam, and

optical means for imaging said phase-matched beam along one axis τ′ and transforming said beam along a perpendicular axis t′ and for illuminating the detector with the resulting light beam.

4,440,473
VOLTAGE POLARITY SWITCHING MEANS FOR CHOLESTERIC LIQUID CRYSTAL DISPLAYS

Souichi Sekimoto, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

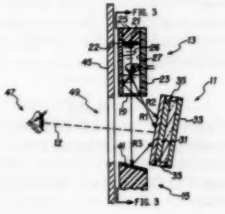
Filed Jun. 5, 1981, Ser. No. 270,723
Claims priority, application Japan, Oct. 31, 1980, 55-152277
Int. Cl.³ G02F 1/137, 1/135, 1/133
U.S. Cl. 350—342 9 Claims

1. A display device comprising: a first transparent electrode; a film layer having an electro-optical effect comprising a layer of nematic liquid crystal material containing several to several tens of percent of cholesteric liquid crystal material; a photosensitive film layer and a second transparent electrode, said first transparent electrode, said film layer having an electro-optical effect said photosensitive film layer and said second transparent electrode being stacked together in the stated order; means for providing a d.c. voltage across said first and second transparent electrodes; and means for switching the polarity of said d.c. voltage applied across said first and second transparent electrodes.

4,440,474
ILLUMINATED PASSIVE DISPLAY FROM AN OBLIQUE ANGLE

James S. Trcka, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 21, 1981, Ser. No. 332,631
Int. Cl.³ G02F 1/133; F21V 9/14, 5/00
U.S. Cl. 350—345 15 Claims



13. Display apparatus comprising:

first means for providing a light beam comprising plane polarized light rays which are substantially collimated, said collimated polarized light rays having electric field vectors, and the orientation of polarization being such that the electric field vectors of said polarized rays are parallel to a first predetermined plane which itself is perpendicular to a second predetermined plane,

display second means for being illuminated by the collimated

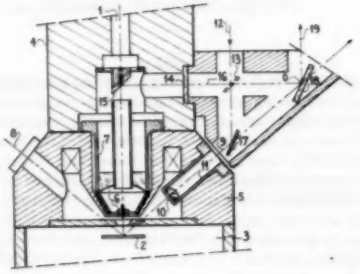
polarized rays of said first means, said second means comprising a reflective dichroic liquid crystal display having a substantially flat front face and being oriented (i) such that said face is substantially perpendicular to said second plane, the collimated polarized light rays reaching said second means thereby having their electric field vectors oriented substantially parallel to said second means front face, and (ii) such that the collimated polarized light rays reaching said second means are directed by said first means to arrive obliquely relative to the front face.

4,440,475

ELECTRON PROBE MICROANALYZER COMPRISING AN OBSERVATION SYSTEM HAVING DOUBLE MAGNIFICATION

Daniel Colliaux, Courbevoie, France, assignor to Compagnie d'Applications Mecaniques a l'Electronique, au Cinema et a l'Atomistique (C.A.M.E.C.A.), Courbevoie, France

Filed Jan. 18, 1982, Ser. No. 339,995
Claims priority, application France, Jan. 23, 1981, 80 01289
Int. Cl.³ G02B *21/18*
U.S. Cl. 350—502 **6 Claims**



1. An electron probe microanalyzer, for analyzing a sample by means of an electron beam, comprising an electromagnetic lens provided with a central channel, for focusing the electron beam and provided with lateral channels, said microanalyzer being equipped with a system for observing the sample to be analyzed, wherein said system comprises a high-magnification mirror-objective placed within said central channel, a stationary device for producing an illuminating beam for illumination of the sample through said objective and associated stationary observation means, an auxiliary objective having lower magnification than the first and placed in one of said lateral channels, and a mechanically-controlled optical device for directing said illuminating beam to either of the two objectives and for directing the return beam from the objective employed to the stationary observation means.

4,440,476

OPTICAL DEVICE FOR AN INTENSIFIER TUBE

Andrew G. Jacobson, 851 Brookhurst, Dallas, Tex. 75218

Filed May 12, 1982, Ser. No. 377,343
Int. Cl.³ G02B *23/12*; H01J *31/50*
U.S. Cl. 350—538 **6 Claims**

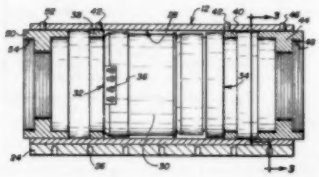
1. An optical device for an intensifier tube comprising:

an elongated housing forming a cylindrical chamber extending therethrough,

means for mounting an intensifier tube in said chamber comprising first and second annular means sized to mate in an axial sliding relationship with the walls of said chamber and fastener means in said housing for releasably fixing said first and second annular means in selective axial position in said housing whereby the axial mounting position of the intensifier tube may be varied,

objective and eye piece optical means for projecting light to and receiving light from the intensifier tube, connector means on each of said eye piece and objective means, and

third and fourth annular means sized to axially slide in said housing, said third annular means positioned in said chamber at one end of said housing, said fourth annular means positioned in said chamber at the other end of said housing whereby the intensifier tube and said first and second annular means will be positioned between said third and fourth annular means, connector means on each of said third and fourth annular means for releasable mating



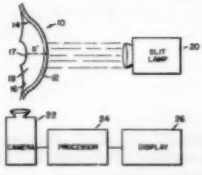
engagement with said connector means of said objective and eye piece optical means, and fastener means in said housing for releasably fixing said third and fourth annular means in selective axial position in said housing whereby said eye piece and said objective means can be mounted extending from the ends of said housing and said eye piece means can be releasably mounted in a fixed position a relative distance from one end of said intensifier tube and the objective means can be releasably mounted in a fixed position a relative distance from the other end of said intensifier tube.

4,440,477

METHOD AND DEVICE FOR MEASURING THE OPTICAL POWER OF THE CORNEA

Ronald A. Schachar, Denison, Tex.

Filed Oct. 30, 1981, Ser. No. 316,664
Int. Cl.³ A61B *3/10, 3/14*
U.S. Cl. 351—212 **21 Claims**



1. A device for measuring the optical power of the cornea, comprising:

means for illuminating the cornea with light from an object disposed a known distance from the anterior surface of the cornea; and

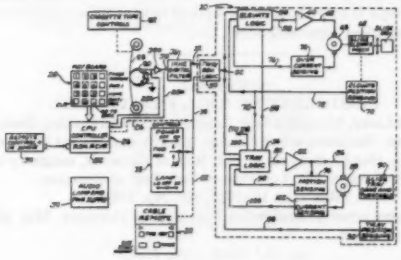
means for forming an optical representation of a cross section of the cornea and means for directly measuring from said optical representation the distance from the anterior corneal surface to the image formed by light from the object passing through the corneal surface such that the radius of curvature of the anterior surface of the cornea can be calculated.

4,440,478

SLIDE TRAY POSITION SENSING ARRANGEMENT FOR SLIDE PROJECTOR APPARATUS UTILIZING TWO SLIDE TRAY TYPES

Nicholas Mischenko, Mount Prospect; Robert R. Parker, Wheeling, and Rudolph Starai, Arlington Heights, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 31, 1981, Ser. No. 336,471
Int. Cl.³ G03B 23/04
U.S. Cl. 353—25 11 Claims



1. In slide projector apparatus having a drive transport arrangement for carrying a rotary slide tray including a plurality of slide positions and for selectively moving the slide tray to present the slide positions to a slide change station, and a position detecting arrangement for detecting the position of said drive transport arrangement, the detecting arrangement including an array defining arrangement for defining a predetermined array of spaced apertures, the predetermined array including one aperture corresponding to each of the slide positions in a predetermined slide tray, the array defining arrangement being moved by the drive transport arrangement along with the slide tray, the detecting arrangement further including an illumination source positioned on one side of the aperture array defining arrangement and a photodetection arrangement arranged along the path of travel of the predetermined aperture array and on the side of the aperture array opposite the light source such that illumination from the illumination source impinges on the photodetection arrangement when an aperture is within a predetermined vicinity of a detection station defined by the detecting arrangement, wherein the improvement comprises the drive transport arrangement comprising a rotary turntable, and the aperture defining arrangement comprising a circumferential aperture ring having the predetermined aperture array formed therethrough as a circumferential array, said turntable comprising turntable accepting means for carrying said aperture ring, said ring turntable accepting means being formed as a portion of said turntable below the top surface of said turntable that carries the slide tray.

4,440,479

REFLEX PHOTOMETRIC ASSEMBLY FOR CAMERA

Kazuyuki Nemoto, Hachioji, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

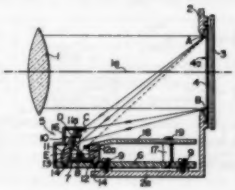
Filed Dec. 3, 1981, Ser. No. 327,125
Claims priority, application Japan, Jan. 14, 1981, 56-4745; Jan. 16, 1981, 56-5193[U]
Int. Cl.³ G03B 7/00
U.S. Cl. 354—480 12 Claims

1. A reflex photometric assembly for a camera determining its proper exposure by receiving light which passes through a taking lens and is reflected by a shutter blind and a film surface towards a photometric transducer element for photometry, the assembly comprising:

a mounting member which is secured to the body of the camera;

means supporting said photcelectric transducer element being secured upon said mounting member;

a one-piece light receiving structure integrally formed of a reflecting member having a reflecting surface to direct the light reflected by the shutter blind and the film surface toward the photoelectric transducer element and a shield member having shield means to prevent light reflected by either the shutter blind or the film surface from directly impinging upon the element and connecting members



extending between said reflecting member and said shield member, said connecting members, said reflecting member and said shield member cooperatively defining an opening in which the transducer element is positioned; and

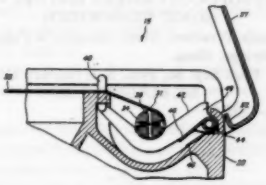
said mounting member including means for positioning and fixing the light receiving structure for simply and yet accurately positioning said transducer element relative to said reflecting surface and said shield member.

4,440,480

FILM SAVING APPARATUS FOR PHOTOGRAPHIC CAMERA

James K. Skurski, 5591 Clinchfield Trail, Norcross, Ga. 30092

Filed Jul. 26, 1982, Ser. No. 401,878
Int. Cl.³ G03B 35/10
U.S. Cl. 354—110 8 Claims



1. Film saving apparatus for a photographic camera of the type for use with roll film having a lead end with a tongue portion extending from a notched portion thereof comprising:

a housing,

a take-up spool disposed in said housing,

means for supplying film having a tongue portion extending from a notched portion at the leader end of the film along a predetermined path onto said take-up spool,

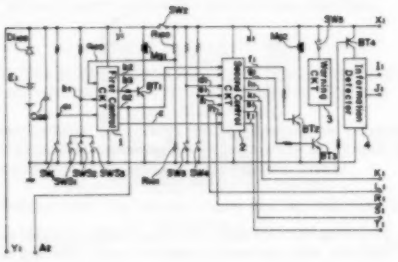
stop means positioned in the film path at right angles thereto and having a length across the film path that is insufficient to block the tongue portion of the film but which will block the notched portion of the film, said stop means being moveable from a first position in the film path to block the film at the notched portion thereof to a second position out of the film path permitting the film to be advanced along its path onto said take-up spool, and

actuating means to move said stop means from its first position in the film path blocking the advance of the film to a second position out of the film path permitting the film to advance along its path onto said take-up spool.

4,440,481
PHOTOGRAPHIC CAMERA

Takeo Hoda; Shigeru Oyokota; Kiyoshi Seigenji, all of Sakai, and Nobuyuki Taniguchi, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 27, 1982, Ser. No. 424,630
Claims priority, application Japan, Oct. 14, 1981, 56-164486
Int. Cl.³ G03B *17/18, 17/42*
U.S. Cl. 354—171 17 Claims



1. A photographic camera capable of being used with a roll film, which comprises:

a spool for rolling up the film;

means for certifying that the tip of film is fastened to said spool;

a back lid of the camera for enclosing the roll film;

means for detecting whether said back lid is opened or closed;

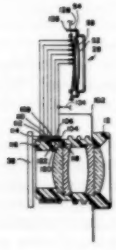
means, responsive to said certifying means and said detecting means, for disabling the film winding up operation of the camera when the tip of film is fastened to said spool and said back lid is left open; and

means for cancelling said disabling means.

4,440,482
SONIC AUTOFOCUS CAMERA HAVING VARIABLE SONIC BEAMWIDTH

Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 30, 1982, Ser. No. 429,820
Int. Cl.³ G03B *3/10*
U.S. Cl. 354—195.1 14 Claims



1. An autofocus camera of the type employing interchangeable lens assemblies, comprising:

a camera body

an adjustable focus lens assembly including a lens having a particular optical field of view and means for detachably mounting said lens assembly on said camera body;

a rangefinder for deriving a signal representative of subject distance, said rangefinder including a capacitance-type sonic transducer, that includes a backplate member, for transmitting sonic energy toward a distant subject and for receiving a reflection of said energy from said subject;

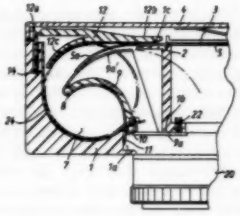
drive means coupled to said adjustable focus lens assembly and responsive to said rangefinder derived signal-for adjusting said lens to a focus position that will cause said lens assembly to form an in-focus image of a subject, located at a distance determined by said rangefinder, at the camera focal plane; and

means for changing the effective size of a surface of said backplate member to thereby change the sonic beam angle of said transducer such that the magnitude of said beam angle is correlated to the optical field of view angle of an attached adjustable-focus lens.

4,440,483
PHOTOGRAPHIC ROLL FILM CAMERA

Gerda Linke, Munich; Dieter Engelsmann, Unterhaching; Dieter Maas, Baldham; Alfred Bässler, Munich, and Hubert Hackenberg, Holzkirchen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,839
Claims priority, application Fed. Rep. of Germany, May 26, 1981, 3120864
Int. Cl.³ G03B *1/56, 17/02*
U.S. Cl. 354—212 20 Claims



1. A photographic roll film camera, comprising means for accommodating a film supply; means forming a spoolless film take-up chamber; means for transporting a film between said film supply means and said film take-up chamber; means for forming a film roll in said film take-up chamber, said take-up chamber having a wall which corresponds to a whole film roll and thereby forms one part of said film roll forming means, said film roll forming means further having a spring-biased guiding lever extending into said take-up chamber and bounding together with said wall a small space in said take-up chamber for forming a first coil of the film roll so that an initial portion of the film can be guided into said small space by said guiding lever and thereafter with increase of a diameter of the film roll during winding of subsequent coils said guiding lever turns and thereby said space expands, and an adjustable stationary abutment, said guiding lever having a lever arm which is spring-biased to abut against said stationary abutment for fixing a depth of turning of said guiding lever.

4,440,484
CAMERA LENS BARREL HAVING RETRACTABLE MOVABLE CONTACTS

Shinsuke Komoto, and Yasuyuki Haneishi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1982, Ser. No. 369,770
Claims priority, application Japan, Apr. 21, 1981, 56-57504[U]
Int. Cl.³ G03B *17/14*
U.S. Cl. 354—286 8 Claims

1. A lens barrel for a camera body having a first mount electrically connected to a first branch circuit and at least one

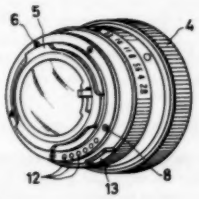
first contact electrically connected to a second branch circuit, comprising:

a second mount;

means for mounting said second mount onto said first mount;

at least one movable second electrical contact located on said second mount, said movable second contact being retractable and extendable into and out of a surface of said second mount, said movable second contact being spaced apart from said first contact when retracted, said movable second contact being electrically connected with said first contact when extended;

switching means connected to said movable second contact for transmitting movement thereto;



means for electrically connecting said second contact to said first mount of said camera body so that said first branch circuit, said movable second contact, and said first contact are electrically connected with said second branch circuit of said camera body when said movable second contact is extended;

said switching means comprising a switching member integrally connected to said movable second contact, a first end of said switching member extending radially outward beyond an outer surface of said second mount, said first end being movable along an axial direction of said lens barrel to extend and retract said movable second contact.

4,440,485

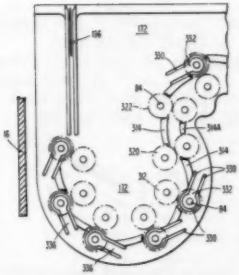
APPARATUS FOR CONTINUOUSLY AUTOMATICALLY PROCESSING A PLURALITY OF DENTAL X-RAY FILMS

Robert Maldonado, Santa Clara, and Raymond A. Erickson, Gilroy, both of Calif., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 17, 1983, Ser. No. 458,374

Int. Cl.³ G03D *3/08*

U.S. Cl. 354—322 **7 Claims**



1. Apparatus for continuously automatically developing a plurality of film separately released by a dispenser disposed in dispensing relaltionship to a developer tank for developing said film, said apparatus including a fixer tank, a rinse tank, and a drying area in respective sequential communication with said developer tank, each of said tanks containing respective liquids therein, roller support means for rotatably mounting pairs of spaced drive rollers in a curvilinear path sequentially through said liquids in each of said tanks and linearly along said drying area, means to operably rotate each of said pairs of drive rollers such that said film released by said dispenser is grasped by said pairs of rotating rollers to be sequentially propelled through said drying area, the improvement thereto comprising,

cantilevered spring means provided in said roller support means at portions thereof where one of said rollers of a pair thereof is rotatably mounted, said cantilevered spring means having a leg portion integral with said roller support means and a cut-out portion surrounding said leg portion.

4,440,486

FIXING APPARATUS

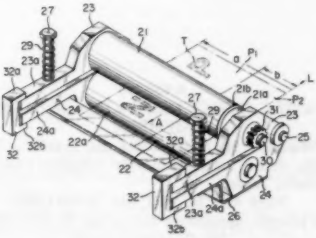
Kazuo Isaka, Kawasaki, and Fumitaka Kan, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1982, Ser. No. 369,001

Claims priority, application Japan, Apr. 20, 1981, 56-59469; Nov. 21, 1981, 56-187445; Nov. 21, 1981, 56-187446; Feb. 26, 1982, 57-30247

Int. Cl.³ G03G *15/00, 15/20*

U.S. Cl. 355—3 FU **15 Claims**



1. A fixing apparatus of the type in which a nip pressure is applied to a toner image bearing member between a pair of rotary members to fix the toner image onto the bearing member, said fixing apparatus comprising:

a first rotary member;

a second rotary member disposed to nip a toner image bearing member between said first and second rotary members;

support means for rotatably supporting said rotary members;

a pressing means for applying a pressing force between said first and second rotary members; and

limiting means, which, at least when said toner image bearing member enters between said first and second rotary members, act on said support means independently from said pressing means for restraining the inter-axis distance between said two rotary members from increasing more than a predetermined value.

4,440,487

COPYING APPARATUS

Makoto Miura, Hino, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1982, Ser. No. 377,555

Claims priority, application Japan, May 22, 1981, 56-77599; May 22, 1981, 56-77600; May 22, 1981, 56-77601

Int. Cl.³ G03G *15/00*

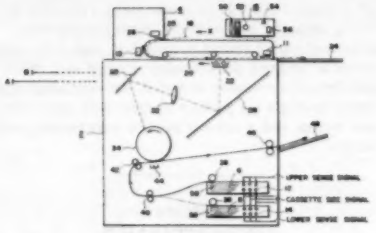
U.S. Cl. 355—14 R **14 Claims**

1. A copying apparatus comprising:

means for sensing a size of an original to be copied so as to output an original size information;

first controlling means for controlling a copying operation; and

second controlling means for controlling said first controlling means so as to perform copying operation control in



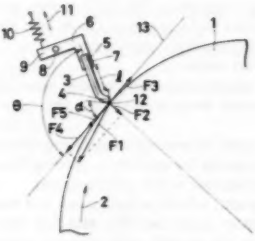
accordance with said original size information by said sensing means as needed.

4,440,488

CLEANING DEVICE FOR AN IMAGE-CARRYING MEMBER

Takashi Maekawa; Shoji Matsumoto, and Toshikazu Matsui, all of Osaka, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Aug. 25, 1982, Ser. No. 411,479
Claims priority, application Japan, Sep. 3, 1981, 56-139283
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—15 **4 Claims**



1. A cleaning device for an image carrying member which includes an elastic blade having a proximal end fixed to a holder and a terminal end held against said image carrying member for removing toner from said image-carrying member upon movement of the image-carrying member, wherein said terminal end of said blade is flexing to extend forward in the moving direction of the image-carrying member at an angle of α to a line tangential to a surface of said image-carrying member rearward of a contact point between said terminal end of the blade and said image-carrying member with respect to said direction, and said blade has an axis passing through said proximal end of said blade and extending at an angle of θ to said line rearward of said point with respect to said direction, said angles α and θ being selected to meet the following relationship:

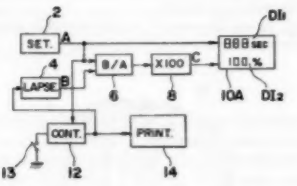
$$\theta > 90° > \alpha.$$

4,440,489

EXPOSURE AIDING DEVICE FOR AN ENLARGER

Yoshio Yuasa, Kawachinagano, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 12, 1982, Ser. No. 397,233
Claims priority, application Japan, Jul. 16, 1981, 56-105641[U]
Int. Cl.³ G03B *27/70*
U.S. Cl. 355—69 **10 Claims**



1. An exposure aiding device for an enlarger comprising:

means for setting an exposure amount to output a setting signal corresponding to said set exposure amount,

means for outputting successively an elapsed signal corresponding to an instantaneous amount of exposure accumulated from a start of printing process of said enlarger,

means for calculating a value corresponding to a ratio of said elapsed exposure amount to said set exposure amount based on said setting signal and said elapsed signal to output a calculated signal indicating said calculated ratio, and

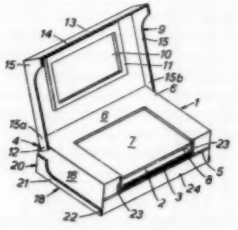
means for informing an information relating to said calculated ratio based on said calculated ratio.

4,440,490

COMBINED MASKING FRAME AND PHOTOGRAPHIC SHEET MATERIAL CONTAINER

Michael H. Moore, Ilford; Brian F. Moss, Rayleigh, and George F. A. M. Turner, Ingatestone, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 25, 1982, Ser. No. 436,254
Claims priority, application United Kingdom, Nov. 4, 1981, 8133191
Int. Cl.³ G03B *27/58*
U.S. Cl. 355—72 **5 Claims**



1. A combined masking frame and photographic sheet material container having a top face and a bottom face and comprising

a storage space having a side opening for removing sheets of said material stored in said space,

flat panel means in at least one of said top and bottom faces, said panel means having a rectangular recess therein of a size adapted for accomodating a sheet of said stored material,

said recess having a light-reflecting planar recess bottom surface,

lid means being hingedly attached to at least one of the top and bottom faces of said container, in such a manner as to cover, when in closed position, the flat panel means in the respective container face to which it is attached,

each lid means present comprising a lid having a rectangular opening,

hinge means on one side of said lid for connecting said lid to said container, and

an angular flange depending from the side of said lid opposite said hinge means and adapted for covering said side opening in a light-tight manner when said lid is in closed position,

said rectangular lid opening being of somewhat smaller area size than said recess, whereby said lid is adapted to serve as a masking frame around the edges of a sheet of said material placed in said recess,

said container and lid being composed of opaque material.

4,440,491

PHOTOGRAPHIC TRANSPARENCY SUPPORTING DEVICE

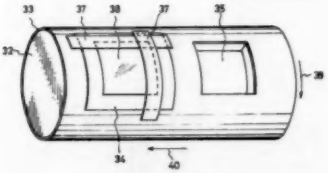
Sho Takahama, Takarazuka, Japan, assignor to Konan Camera Research Institute, Hyogo, Japan

Filed Sep. 24, 1981, Ser. No. 305,186

Claims priority, application Japan, Oct. 2, 1980, 55-138447

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—75 **3 Claims**



1. A photographic transparency supporting device comprising a supporting base member having at least one window therein and at least one holding member for holding a photographic transparency between both members and in overlying relationship to said window, a magnetic rubber layer covering at least that portion of said base member surrounding said window and said holding member is formed of a material attracted by said magnetic rubber layer.

4,440,492

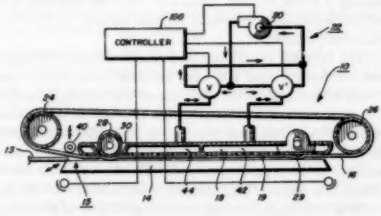
VARIABLE FORCE WIDE DOCUMENT BELT TRANSPORT SYSTEM

Anthony Howard, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 3, 1982, Ser. No. 414,713

Int. Cl.³ G03B *27/62, 27/64*

U.S. Cl. 355—76 **14 Claims**



1. In a document transport for transporting document sheets over a copier platen and into a registration position thereon for copying with a single, light reflective, flexible, unapertured and air impervious wide frictional movable belt providing a uniform light imaging background for the document sheet, the improvement comprising:

selectably actuatable vacuum means for selectably applying a vacuum to vacuum plenum means overlying said vacuum belt above said platen,

said vacuum means lifting all but selected minor areas of said belt away from said platen toward said vacuum plenum means when a vacuum is applied to said vacuum plenum means,

said vacuum plenum means allowing said belt to drop from said vacuum plenum means into engagement with a document sheet on the platen over a much larger area of said belt when said vacuum is removed from said vacuum plenum means as compared to when said vacuum is applied to said vacuum plenum means, and

belt deforming means for deforming said minor areas of said belt away from said vacuum plenum means towards said platen for selective area driving of a document sheet on the platen with said deformed minor areas of said belt when said vacuum is applied to said vacuum plenum means.

4,440,493

PRINTING APPARATUS

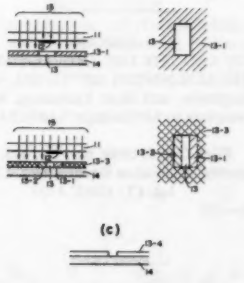
Ryozo Hiraga, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 385,980, Jun. 7, 1982, abandoned, which is a continuation of Ser. No. 260,392, May 4, 1981, abandoned. This application Mar. 2, 1983, Ser. No. 471,062

Claims priority, application Japan, May 14, 1980, 55-63784; May 14, 1980, 55-63785; May 14, 1980, 55-63786; May 14, 1980, 55-63787; May 14, 1980, 55-63788

Int. Cl.³ G03B *27/04*

U.S. Cl. 355—86 **5 Claims**



1. An apparatus for forming a mask pattern on a wafer and printing the mask pattern on the wafer, said apparatus comprising:

a source of radiation energy for imparting a divided exposure radiation energy to a mask a plurality of times; and

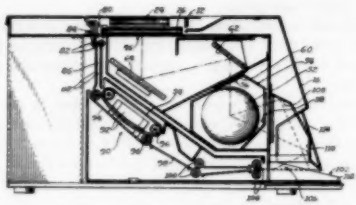
means for moving at least one of said mask and wafer relative to the other of said mask and said wafer for making the relative positional relation of the mask pattern and the wafer differ by a minute amount each time said divided exposure is effected.

4,440,494

MICROFILM DUPLICATOR

Thomas R. Wells, Des Plaines, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sep. 28, 1982, Ser. No. 425,219
Int. Cl.³ G03B 27/30
U.S. Cl. 355—100 **18 Claims**



1. An integral unit for duplicating images received from a microfiche onto a duplicating medium comprising:

an exposure station, a developing station and a discharge station, all housed within an integral enclosure;

the exposure station comprising means to form a latent image on the duplicating medium by exposure of the duplicating medium to the images on the microfiche,

microfiche support means for retaining the microfiche in a fixed microfiche plane, and

duplicating medium support means for retaining the duplicating medium in a first position parallel to the microfiche plane during exposure of the duplicating medium;

a developing path traversable by the duplicating medium extending from the exposure station to the developing station;

the duplicating medium support means moveable to a second position to discharge the duplicating medium into the developing path;

the developing station comprising means for developing the latent images on the duplicating medium;

a discharge path traversable by the duplicating medium extending from the developing station to the discharge station;

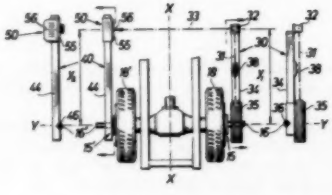
whereby the duplicating medium has a latent image imposed thereon from the microfiche at the exposure station, is developed at the developing station, and is outputted at the discharge station.

4,440,495

APPARATUS AND THE USE THEREOF FOR CHECKING THE ALIGNMENT OF WHEEL AXLES

Hans R. Bergström, and Rolf Malmborg, both of Kungsör, Sweden, assignors to Aktiebolaget SAMEFA, Kungsoer, Sweden

Filed Oct. 9, 1980, Ser. No. 195,458
Claims priority, application Sweden, Oct. 12, 1979, 7908488
Int. Cl.³ G01C 1/00
U.S. Cl. 356—155 **6 Claims**



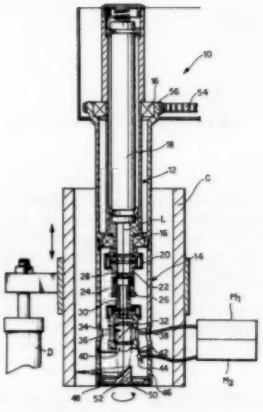
1. In an apparatus for checking and determining the alignment of wheel axes, preferably the axes of two substantially coaxially arranged wheels (a wheel in this context being a single wheel or two wheels together) forming a wheel pair, said apparatus comprising two measuring units in the form of elongate elements each adapted for attachment to an axle of a wheel in a pair of wheels, so that said elements extend substantially at right angles and in the same direction out from the respective axle, one unit comprising a scale unit having a scale situated at a given distance (y_2) from the coacting axle, while the other unit is a beaming unit comprising a ray or beam emitter for emitting a light beam, and a reflector means situated at substantially the same given distance (y_1) from the axle coacting with the beaming unit and adapted for reflecting the light beam substantially 90° in a direction towards said scale on the scale unit, the improvement comprising means for adapting to relative, as opposed to absolute, alignment measurement, including means mounting the scale for displacement along the scale unit and means for locking the scale in a selected position along the scale unit.

4,440,496

PROCESS AND DEVICE FOR INSPECTING AND CHECKING THE INTERNAL SURFACE OF A HOLLOW CYLINDRICAL WORKPIECE WHICH HAS UNDERGONE MECHANICAL WORKING

Emilio Milana, Rivalta, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed May 28, 1981, Ser. No. 267,977
Claims priority, application Italy, May 28, 1980, 67831 A/80
Int. Cl.³ G01N 21/88
U.S. Cl. 356—241 **8 Claims**



1. Process for inspecting and checking the internal surface of a hollow cylindrical workpiece which has undergone mechanical working, particularly a finishing operation of grinding or the like, as a result of which the said internal surface has two sets of intersecting, helical score lines, the process including the steps of:

directing a beam of laser radiation onto the internal surface of the workpiece normally to said surface to form a diffraction pattern;

effecting relative rotational and translational movement of the workpiece and the said incident laser beam respectively about and along the axis of the workpiece to scan the entire internal surface of the workpiece successively,

detecting by photo-electric means the diffraction pattern formed by the laser radiation incident on said internal surface of the workpiece, said diffraction pattern having a cruciform shape the arms of which intersect at angles corresponding to the angles of intersection of the two sets of score lines and which rotate as a result of the relative rotation between the workpiece and the laser beam, the

said photo-electric means providing an electrical output signal which as a function of time as a positive peak in correspondence with the passage of each arm of said diffraction pattern over the photo-electric means;

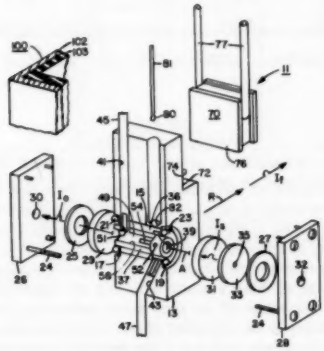
forming from the said electrical output signal an indication related to the characteristics of the two sets of intersecting helical score lines.

4,440,497

COMBINATION ABSORBANCE FLUORESCENCE ASPIRATING THERMAL CUVETTE

Glen A. Carey, North Ridgeville, and Steven J. Hydo, Wellington, both of Ohio, assignors to Corning Glass Works, Corning, N.Y.

Filed May 17, 1982, Ser. No. 378,598
Int. Cl.³ G01N *1/10*
U.S. Cl. 356—246 **9 Claims**



1. An aspirating abosrbance thermal flow cell or cuvette for containing therein a fluid sample to be tested under the influence of an external light source comprising:

a housing having a chamber therein formed with a cylindrical sidewall, said chamber having an inlet and outlet for communicating the fluid sample along a flow path through the same from the inlet to the outlet, the chamber having spaced apart opposed openings centered along a straight line axial optical path and a notch opening in the sidewall, intermediate the opposed openings, forming an axial slot therein;

a pair of first transparent optical windows in the form of flat sided circular disks, one located in each of the opposed openings and being oriented with the flat sides perpendicular to the optical path, the disks closing the opposed openings in the chamber and providing a through window into and out of the chamber for passage of light from the external source through the fluid sample, the light being attenuated in intensity as it passes through the fluid sample, the attenuation being a function of an absorbance characteristic of the fluid sample; and

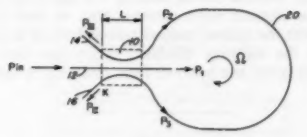
a second transparent optical window, sealed within the slot for closing the side opening and providing a radial optical path for passage of fluorescent light from within the chamber to without the same, said fluorescent light being a function of a fluorescence characteristic of the fluid resulting from exitation by the light from the external source.

4,440,498

OPTICAL FIBER GYROSCOPE WITH (3×3) DIRECTIONAL COUPLER

Sang K. Sheem, Richardson, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 13, 1981, Ser. No. 320,999
Int. Cl.³ G01C *19/64*; G02B *5/14*
U.S. Cl. 356—350 **9 Claims**



1. In an optical fiber gyroscope wherein light is introduced into an optical fiber waveguide formed in a loop for propagating therearound in mutually opposite directions to emerge therefrom for relative phase shift detection induced by rotation of the loop, the improvement residing in a directional coupler for carrying light to and from the loop comprising:

a first elongate optical waveguide adapted to have laser light launched into one end thereof and carry that light therethrough;

second and third optical waveguides including elongate portions thereof coextensively disposed with a length of the first optical waveguide at close distances therefrom and from each other whereby the laser light is coupled thereinto and directed into the loop for propagating therethrough in mutually opposite directions;

said second and third optical waveguides receiving the opposite propagated light from the loop and mixing it for mutual interference by coupling from one to the other across the distance therebetween;

said second and third waveguides directing their respective mixed lights to detection means where their powers are compared;

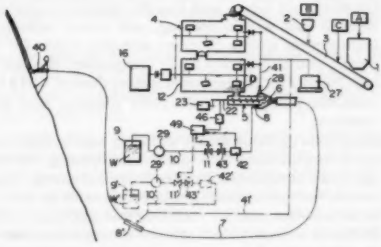
whereby relative changes in light powers provides an indication of loop rotation.

4,440,499

METHOD AND APPARATUS OF BLOWING MORTAR OR THE LIKE

Kouichi Tomikawa, Kanagawa, and Hiroshi Takahashi, Gunma, both of Japan, assignors to Engineering Resources Development Office, Tokyo, Japan

Filed Mar. 3, 1981, Ser. No. 241,458
Claims priority, application Japan, May 3, 1980, 55-27750
Int. Cl.³ B28C *5/06*
U.S. Cl. 366—3 **7 Claims**



1. A method of feeding material, such as mortar or thee like to be blown on compression air, comprising the steps of blowing dry mixture of the material through a feed mechanism of a

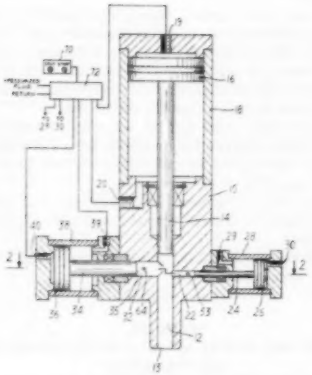
blowing machine; feeding a predetermined amount of the dry mixture from an outlet nozzle of the feeding mechanism of the blowing machine into a hose adapted to transmit the mixture to a working surface via a blowing nozzle and simultaneously supplying liquid of a predetermined amount bearing on the compression air through said outlet nozzles of the blowing machine so that the material is mixed with the liquid while the material is fed into the hose whereby the mixture is transformed from dry condition to wet condition; controlling grains in the mixed material during feeding it in said hose to thereby provide the desired water-cement ratio, so that the mixed material with the desired cement ratio is formed in said outlet nozzle of the blowing machine, enters the hose, travels through the latter, and is blown from said hose by the blowing nozzle.

4,440,500

HIGH PRESSURE IMPINGEMENT MIXING APPARATUS

Fritz W. Schneider, Louisville, Ky., assignor to Polyurethane Technology of America-Martin Sweets Company, Inc., Louisville, Ky.

Filed Jun. 21, 1982, Ser. No. 390,777
Int. Cl.³ B01F 5/04
U.S. Cl. 366—177 **12 Claims**



1. Apparatus for high pressure impingement mixing of at least two liquid components comprising:

a housing having a transfer dispense chamber including a first opening, a second opening, and an outlet for dispensing mixed components;

an impingement mixing chamber means for impingement mixing of liquid components and for directing said components through said first opening into said transfer dispense chamber, and across said transfer dispense chamber out through said second opening, said means including an impingement mixing chamber, injection means for introducing said at least two liquid components into said mixing chamber for impingement mixing thereof, and a reciprocatable plunger for selectively cleaning said mixing chamber;

an aftermixer chamber means, including an aftermixer chamber communicating with said second opening, for receiving mixed components directed from said mixing chamber means, for further mixing said components in said aftermixer chamber, and for returning said mixed components delivered thereto to said transfer dispense chamber such that the returned components are dispensed through said outlet;

second plunger means disposed in said aftermixer chamber for mechanical cleaning of said aftermixer chamber; and

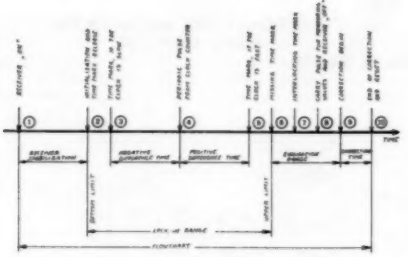
third plunger means disposed in said transfer dispense chamber for mechanical cleaning of said transfer dispense chamber after a dispense operation.

4,440,501

METHOD OF AUTOMATIC ADJUSTMENT OF SELF-CONTAINED RADIO-CLOCK BY MEANS OF TIME MARK

Werner Schulz, Valentinianstr. 6, 6802 Ladenburg, DE, Fed. Rep. of Germany

Filed Jun. 11, 1981, Ser. No. 272,559
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022949; European Pat. Off., Mar. 25, 1981, 81102235
Int. Cl.³ G04C 11/02
U.S. Cl. 368—47 **6 Claims**



1. A method of automatic adjustment, by means of a reference time mark which according to a time scale is periodically transmitted by a transmitter, of a self-contained radio-clock including an oscillator and a display, comprising the steps of deriving from the oscillator frequency a predetermined lock-in time range defining a lower limit and an upper limit which exceeds the range of the time mark; measuring periodically data relating to the deviation of the rate of the clock, such as the magnitude and direction of the deviation, by comparing the time marks with the periodic pulses from the clock; storing the measured deviation data for use to provide for correction of the clock rate of the clock in the event the time mark is missing and to provide for a validity check of the measured data; thereupon correcting the rate of the clock and the position of the display according to the stored deviation data without changing the stored data until the next time mark arrives.

4,440,502

ELECTRONIC TIMEPIECE

Fumio Kanno, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1982, Ser. No. 437,176
Claims priority, application Japan, Oct. 27, 1981, 56-170826; Jul. 20, 1982, 57-126147; Jul. 28, 1982, 57-131842
Int. Cl.³ G04B 19/04
U.S. Cl. 368—80 **6 Claims**

1. In an electronic timepiece powered by a battery and having time indicating hands, the improvement comprising:

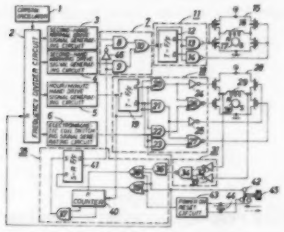
a first stepping motor including a first electromagnetic coil and a first rotor for driving at least a seconds-hand;

a second stepping motor including a second electromagnetic coil and a second rotor for driving at least an hours-hand;

a means for judging failure of stepping of said second rotor of said second stepping motor; and

a controlling means responsive to the output of said judging

means for causing said first stepping motor to be actuated in a warning mode different from the normal mode to give



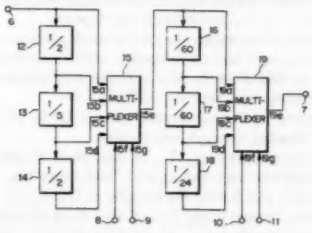
warning of the failure of stepping of said second rotor of said second stepping motor.

4,440,503

ELECTRONIC TIMER

Isao Arichi, Kurahsiki; Tetuya Waniisi, and Takuji Koh, both of Okayama, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 4, 1981, Ser. No. 299,582
Claims priority, application Japan, Sep. 8, 1980, 55-128312[U]
Int. Cl.³ G04F *10/02*
U.S. Cl. 368—107 **3 Claims**



1. An electronic timer comprising:

a case having first and second windows and a manually adjustable control therein for setting a desired time;

an oscillator within said case;

a first frequency divider within said case for dividing the output of said oscillator at one of a plurality of first dividing factors;

first selecting means within said case for manually selecting one of said first factors including switch means having a display viewable through said first window and indicating a multiplication factor for the set time;

a second frequency divider within said case for dividing the output of said first selecting means by one of a plurality of second dividing factors; and

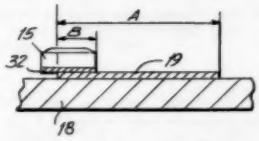
second selecting means within said case for manually selecting one of said second factors including switch means having a display viewable through said second window and indicating timing in seconds, minutes, hours, or days.

4,440,504

ELECTRONIC TIMEPIECE INCLUDING A PIEZOELECTRIC ALARM

Hajime Miyazaki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,610
Claims priority, application Japan, Aug. 7, 1980, 55-108520
Int. Cl.³ G04C *21/16*
U.S. Cl. 368—255 **10 Claims**



1. An electronic timepiece including a piezoelectric type alarm buzzer comprising:

a timepiece case having a front side with an opening for viewing a display of time and an opposed caseback;

a timepiece movement for generating at least a display of time and alarm drive signals and a battery for driving said movement, said movement and battery disposed within said timepiece case;

a substantially planar piezoelectric element electrically coupled to said movement and mounted on said caseback wherein said element has a dimension of at least length A in a radial direction on the caseback;

an electrical insulating member contacting a portion of said piezoelectric element; and

said battery is substantially circular in plan view and is mounted on said insulating member, said insulating member overlaps said piezoelectric element a distance B, the ratio B/A being about 0.5 or less.

4,440,505

WATCHCASE HAVING A THIN APPEARANCE WHEN BEING WORN

Paul Gogniat, Bienne, Switzerland, assignor to Montres Rado S.A., Longeau, Switzerland

Filed Jul. 21, 1982, Ser. No. 400,372
Claims priority, application Switzerland, Aug. 10, 1981, 5129/81
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—292 **12 Claims**

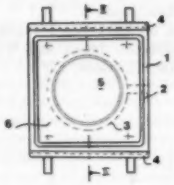
1. A watch case comprising a case band, a crystal and a back detachably mounted on the case band and a caging ring for positioning a movement of the watch in the case, characterized in that:

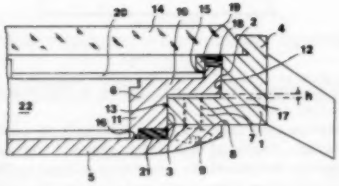
the case band has an upper opening sealed by the crystal and a smaller-sized lower opening defined by a projection of said case band radially extending inwardly at the lower part of case band,

the caging ring has an upper portion and a lower portion containing outer surfaces, the outer surfaces of said upper and lower portions of said caging ring fitting within the upper and lower openings, respectively, of the case band, the ring being insertable in said case band through its upper opening before the mounting of the crystal and being fit into the lower opening of the case band; and

the back is held against the lower surface of the projection of the case band by means of set screws, said set screws being tightened to lock the caging ring in the case, wherein the watch case presents a thinner appearance than it has by

providing said smaller lower opening of said case band and said caging ring to enable the edge of the back and





said set screws to be moved inwardly so as to be hidden when worn on a wrist.

4,440,506

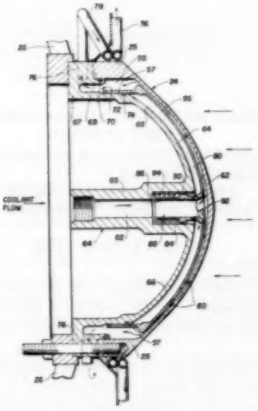
LASER POWER METER

Frederick G. Eitel, North Palm Beach, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 5, 1982, Ser. No. 365,747

Int. Cl.³ G01K *17/00*

U.S. Cl. 374—32 **15 Claims**



1. A laser power meter, comprising:

conversion means for converting incident laser radiation into thermal energy, which conversion means includes an optic which absorbs and converts at least a portion of the incident laser radiation into thermal energy;

a fluid channel adjacent said optic, which fluid channel conducts a fluid in heat exchange relationship with said optic, and which fluid channel is defined by a disk which is spaced apart from said optic; and

gap control means, responsive to changes in the shape of said optic, for regulating the spacing between said optic and said disk and thereby regulating the width of said fluid channel.

4,440,507

PROCEDURE FOR MEASURING THERMAL ENERGY TRANSPORTED BY FLUID FLOW

Matti R. Karras, and Olavi Hirsimäki, both of Finnish, Finland, assignors to Valmet Oy, Finland

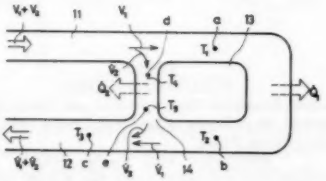
PCT No. PCT/FI81/00038, § 371 Date Jan. 26, 1982, § 102(e) Date Jan. 26, 1982, PCT Pub. No. WO81/03543, PCT Pub. Date Dec. 10, 1981

PCT Filed May 27, 1981, Ser. No. 354,092

Claims priority, application Finland, May 28, 1980, 801730

Int. Cl.³ G01K *17/08*

U.S. Cl. 374—39 **11 Claims**



1. A method for measuring thermal power Q_1 transferred to or from a fluid flowing through a consumption unit at a volumetric flow rate V_1, comprising the steps of:

connecting a bypass line in parallel with a line carrying said fluid through said consumption unit and allowing a portion of said fluid to flow through said bypass line at a volumetric flow rate V_2,

transferring additional thermal power Q_2 to or from said fluid flowing through said bypass,

measuring temperature, T_1, of said fluid flowing in said consumption unit line as said fluid flows into said consumption unit before the transfer of Q_1,

measuring temperature, T_2, of said fluid flowing in said consumption unit line as said fluid flows out of said consumption unit after the transfer of Q_1,

measuring temperature, T_4, of fluid flowing through said bypass as said fluid flows into said bypass before the transfer of Q_2,

measuring temperature, T_5, of said fluid flowing through said bypass as said fluid flows out of said bypass after the transfer of Q_2,

measuring transfer of Q_2 to or from said fluid flowing through said bypass,

measuring temperature, T_3, of fluid flowing in a return line downstream of said consumption unit and bypass lines, and

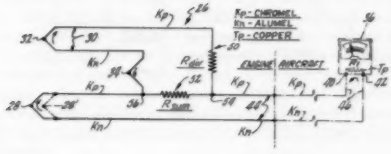
calculating the transfer of Q_1 to or from said fluid flowing through said consumption unit, based on the following formula:

$$\dot{Q}_1 = \frac{(T_1 - T_2) \cdot (T_5 - T_3)}{(T_4 - T_5) \cdot (T_3 - T_2)} \cdot \dot{Q}_2.$$

4,440,508
DETECTOR-TRANSDUCER FOR SENSING TEMPERATURES IN AN ENGINE

Joseph J. Haloburdo, Jr., Bolton, and Rocco M. Tommasini, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 9, 1982, Ser. No. 367,147
Int. Cl.³ G01K 7/14
U.S. Cl. 374—144 11 Claims



1. A detector-transducer for sensing a temperature in an engine having locations at different temperatures and working medium fluids flowing therethrough, which comprises:

a means for detecting temperature and transducing the temperature into a first electromotive force;

a resistor in series with the means for detecting and transducing temperature;

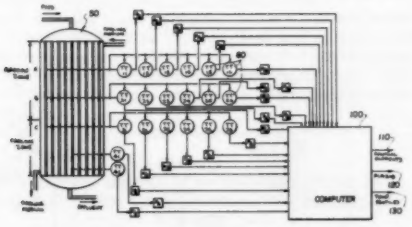
a supplementary thermocouple having a first junction and a second junction in series which are connected across the resistor;

wherein the first junction is placed in heat transfer communication with working medium fluids flowed through the engine at a first temperature and the second junction is placed in heat transfer communication with fluids flowed through the engine at a second temperature that is not equal to the first temperature to develop a second electromotive force which is adapted to bias the first electromotive force under operative conditions.

4,440,509
DETECTION OF HOT AND COLD SPOTS IN CHEMICAL REACTORS

Suresh C. Agarwal, Euclid, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 29, 1982, Ser. No. 363,200
Int. Cl.³ G01K 7/00, 13/00
U.S. Cl. 374—166 5 Claims

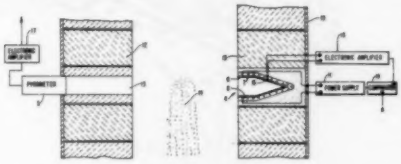


1. An apparatus for determining the temperature gradient in an isothermic chemical reactor having a longitudinal axis and a plurality of longitudinally extending heat transfer medium tubes, one tube coinciding with said longitudinal axis, comprising, a first plurality of temperature sensors distributed at equispaced locations along said tube, and a second plurality of at least six temperature sensors on a cross-sectional plane of the reactor passing through each of said locations, said longitudinally extending tubes grouped into sets of tubes each within an equitempered zone axially symmetrical about the longitudinal axis, at least one temperature sensor of said second plurality of temperature sensors in one tube of each set, some of said second plurality of temperature sensors equispaced along a radial line in each cross-sectional plane.

4,440,510
PYROMETRIC GAS TEMPERATURE MEASUREMENT SYSTEM

Alexander Stein, Secaucus, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 324,973, Nov. 25, 1981. This application Sep. 9, 1982, Ser. No. 416,291
Int. Cl.³ G01K 7/00; G01J 5/16
U.S. Cl. 374—169 8 Claims



1. A system for remotely measuring the line averaged temperature of hot gases in a fired furnace comprising:

(a) a black body in thermal contact with said gas, wherein said black body is fixed to an interior furnace side wall by means such that it is heated to within 100° C. below said temperature of said hot gases;

(b) heating means surrounding said black body for adjusting physical temperature of said black body;

(c) thermometer means in said black body for measuring the physical temperature of said black body;

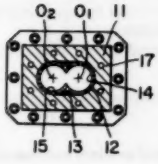
(d) a spectral pyrometer means in an opposite side wall viewing said black body through said gas wherein said spectral pyrometer operates at a wavelength where said gas has an emissivity within the range of 0.1 and 0.9; and

(e) electronic means for comparing the physical temperature of said black body as measured by said thermometer with the radiation temperature measured by said spectral pyrometer to obtain a resultant signal that is used to control said heating means.

4,440,511
MULTISHAFT SUPPORTING DEVICES

Junya Ishibashi, Numazu; Shigeru Miyazaki, Mishima, and Shoichi Tanaka, Shizuoka, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1982, Ser. No. 417,862
Claims priority, application Japan, Sep. 17, 1981, 56-146749
Int. Cl.³ F16C 17/22
U.S. Cl. 384—278 5 Claims



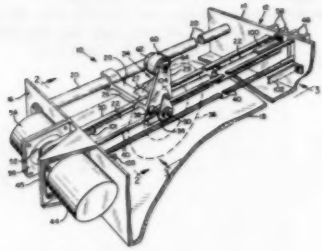
1. A multishaft supporting device comprising a barrel provided with a bore, a sleeve inserted into said bore and provided with an opening for receiving a plurality of shafts, and inserts interposed between said barrel and said sleeve, said inserts being made of material having larger thermal expansion coefficient than said barrel and said sleeve.

4,440,512

DAISY WHEEL PRINTER HAVING LOW MASS CARRIAGE

Mitchell D. Forcier, 14007 SE. 30th St., Apt. H, Vancouver, Wash. 98664

Filed Jun. 7, 1982, Ser. No. 385,849
Int. Cl.³ B41J 1/30
U.S. Cl. 400—144.2 3 Claims



1. A printer comprising:

frame means including a guide means extending from side to side of the frame means;

a carriage mounted for side-to-side movement on the guide means;

a print wheel rotatably mounted on the carriage;

first and second bidirectional stepping motor means mounted on the frame means;

first drive means including a first drive belt connected to the carriage and drivable by the first stepping motor means for indexing the carriage along the guide means to a selected print position, and

second drive means including a second drive belt drivingly interconnecting the second motor means and the print wheel for rotating the print wheel to a selected angular position to present a selected print character at said print position;

said belts being arranged so that indexing the carriage induces proportional rotation in the print wheel;

the first drive means being proportioned to the second drive means so that stepping the first stepping means by a single step rotates the print wheel by an amount equal to an amount of wheel rotation resulting from stepping the second stepping motor means an integral number of steps;

the first drive means including a first drive pulley of circumference A on the first motor means,

the second drive means including a second drive pulley of circumference B on the second motor means and a print wheel pulley of circumference C drivingly connected to the print wheel;

the first step motor means being operable to produce M steps per revolution;

the second step motor means being operable to produce N steps per revolution;

the first and second drive pulleys being sized so that:

$$\frac{A}{M} = \frac{K \times B}{N},$$

K being said integral number; and the print wheel pulley being sized so that:

$$\frac{B}{N} = \frac{C}{L},$$

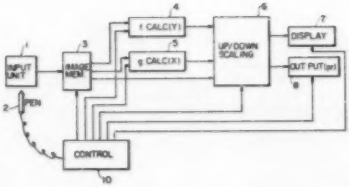
L being the number of angular spaced character positions on the print wheel.

4,440,513

CHARACTER SHAPING DEVICE

Hiroyuki Katsoka, and Yoshio Arai, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1982, Ser. No. 356,544
Claims priority, application Japan, Mar. 12, 1981, 56-34631
Int. Cl.³ G06K 9/00
U.S. Cl. 400—165.1 8 Claims



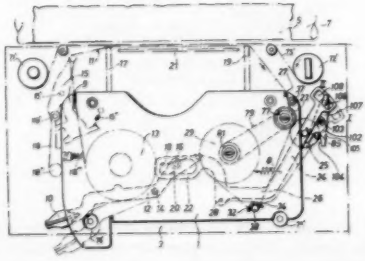
1. A character shaping device, comprising: an image memory for reading a character in a tablet area and for storing said character as image information in the form of a binary signal for each of a plurality of picture elements; means for determining an x-peripheral distribution function and y-peripheral distribution function of said stored information, respectively; means for determining an area bounding said character and the center of gravity position of said character in respective directions from said x- and y-peripheral distribution functions; means for storing a preset normalization area within said tablet area, and the center position thereof; and means for altering said character bounding area to equate said character bounding area with said normalization area, and center said character within said normalization area, to produce a sized, centered character.

4,440,514

ADJUSTABLE RIBBON FEED RATES DEPENDENT UPON RIBBON TYPE FOR INK RIBBON CASSETTES

Alfred Keiter; Wolfgang Mudder, and Bernd Tappeborn, all of Wilhelmshaven, Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 2, 1981, Ser. No. 230,504
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003886
Int. Cl.³ B41J 32/00
U.S. Cl. 400—208 14 Claims



1. In a feed mechanism for advancing an ink ribbon supported in a cartridge which is inserted into a typing machine in feeding steps whose length is determined in dependence upon the type of the ribbon, the cartridge including a supply reel and a takeup reel between which the ribbon is advanced, guides being provided for guiding the ribbon through a printing station of the machine, the improvement wherein said mechanism comprises: a feed roller rotatably mounted in said cartridge for engaging the ribbon to advance the ribbon in feeding steps,

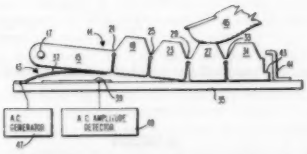
said feed roller being selected from a plurality of feed rollers having respectively different diameters on the basis of the type of the ribbon; a driving device mounted in said machine and including a pressure roller movable into a position against said feed roller when said cartridge is inserted in said machine; and means for rotating said feed roller in angular steps for advancing the ribbon in corresponding feeding steps, said rotating means being settable for causing each angular step of rotation of said feed roller to have a selected one of at least two different magnitudes, each magnitude corresponding to a respectively different ribbon feeding step length, and said rotating means being coupled to said pressure roller in a manner to be set to produce angular rotation steps of a selected magnitude in dependence on the position of said pressure roller when said pressure roller is in its position against said feed roller, whereby the magnitude of each ribbon feeding step is automatically determined as a function of the diameter of said selected feed roller.

4,440,515

KEYBAR KEYBOARD

Ernie G. Nassimbene, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,921
Int. Cl.³ B41J *5/28*
U.S. Cl. 400—479 **6 Claims**



1. A keyboard comprising:

a plurality of keybar actuators, said keybar actuators each comprising:

at least three keys interconnected one to the other and jointly movable in the same common direction about at least one common pivot upon depression of any key of a given keybar actuator, said remaining keybar actuators being independently pivoted to remain stationary during such movement of said given keybar actuator;

switch actuation means responsive to the movement in said common direction of any depressed key of said given keybar actuator to indicate which one of said at least three keys of said given keybar actuator was depressed upon movement of said given keybar actuator in said common direction.

4,440,516

TRANSPORT DEVICE FOR TRANSPORTING AN ENDLESS FORM TO AND FROM THE PRINTING ROLLER

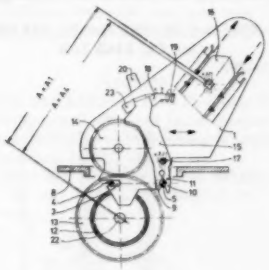
Manfred Rosenthal, Kirchen-Freusburg, and Wendelin Weber, Siegen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 327,974
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046592
Int. Cl.³ B41J *11/32*
U.S. Cl. 400—616.1 **10 Claims**

1. A transport device for transporting an endless form to and from a printing mechanism, which mechanism has a printing roller and a frame within which the roller is journalled for rotation about a roller axis, the frame having two pairs of members for mounting a transport device, the members of each pair being disposed at respective axial locations with respect to the printing roller axis and spaced from each other transversely with respect to said axis,

said transport device comprising two side walls, at least one drive shaft journalled in the side walls, and transport chains which cooperate pair-wise and are arranged on said at least one drive shaft,

characterized in that the device further comprises a respective control lever journalled to each of said side walls for pivoting about a lever axis, said lever comprising a bearing lug disposed to one side of the pivot axis, arranged for engaging one of said members on the mechanism frame,



said device further comprising means for releasably locking the lever in a selected one of a plurality of pivotal positions, said means comprising a projection arranged on each lever at the other side of the pivoting axis for resiliently and releasably engaging the respective device side wall at a respective one of a plurality of positions, and

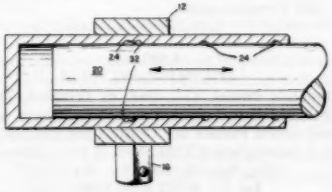
each side wall of the device has a slotted hole for engaging the other member of the respective pair, arranged such that pivoting of the lever causes the side wall to slide along the slotted hole with respect to said other member to adjust the distance between the transport chains and the printing roller.

4,440,517

ADJUSTABLE TORQUE-MULTIPLIER BREAKER-BAR

Michael A. Potter, 8253 Grand Ave., and Richard L. Green, 7671 Joshua View, both of Yucca Valley, Calif. 92284

Filed Mar. 23, 1981, Ser. No. 246,366
Int. Cl.³ F16B *21/00*
U.S. Cl. 403—24 **4 Claims**



1. An adjustable, torque-multiplier breaker-bar which comprises:

an elongated sleeve;

a plurality of interior annular grooves in stepped positions along the longitudinal dimension of said sleeve;

a headpiece secured near the distal end of said sleeve including a headpiece collar secured about said sleeve and said headpiece collar having a tool-holding member;

a rod, slideably inserted into said sleeve at the proximal end thereof, the rod having a handgrip attached at the proximal end of said rod;

biasing ball and spring means near the distal end of said rod

for cooperating with said annular grooves in maintaining an adjusted position of insertion of said rod into said sleeve; and

wherein the specific number of said plurality of interior annular grooves is at least one per inch and with the groove closest to the distal end of said sleeve lying in a transverse plane intermediate the terminal ends of said headpiece collar.

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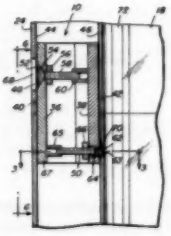
TUBING COUPLING

George N. Davlantes, 7844 Gazette Ave., Canoga Park, Calif. 91306

Filed Oct. 26, 1981, Ser. No. 315,168
Int. Cl.³ F16B 7/04
U.S. Cl. 403—297 **7 Claims**



1. A connector for tubular pieces comprising:

a pair of opposite longitudinal separable elements,

each said element having an exterior portion adapted to engage the interior walls of said tubular pieces,

first threaded means threadedly connected to one of said elements and having an affixed collar adapted to engage an interior surface of the other of said elements for separating said elements and thereby placing said wall engaging portions into pressing engagement with said interior walls,

second threaded means longitudinally spaced from said first means, also threadedly connected to one of said elements and having an affixed collar adapted to engage an interior surface of the other of said elements for separating said elements and thereby placing said wall engaging portions into pressing engagement with said interior walls,

said separable elements being pivotable about one of said threaded means in response to threading of the other of said threaded means.

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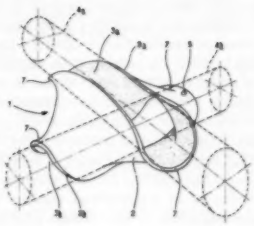
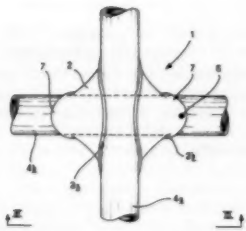
COUPLING MEMBER

Jean-Francois Pennel, 132, Blvd. de l'Hopital, 75013 Paris, France, and Patrick H. Vesnier, Paris, France, assignors to Jean-Francois Pennell and Centrale des Equipements Mobiliers et Immobiliers (CEMI), both of Paris, France

Filed Nov. 28, 1980, Ser. No. 211,137
Int. Cl.³ B25G 3/36; E04G 7/00
U.S. Cl. 403—391 **18 Claims**

1. A device for coupling together two elongated elements extending at an angle to each other, at least one of which has a convex exterior, so that the two elements are held against relative angular displacement with respect to each other, said device comprising a substantially rigid one piece band comprised of a continuous closed loop of essentially uniform wall thickness, said band having two substantially continuously curving rims, each rim defining an opening which forms the boundary of a recess for receiving a corresponding one of the elements to be coupled together, said boundaries of said recesses defined by said openings defining a single space within and laterally bounded by said band, and each rim substantially constituting a curve traced on a convex surface of the corresponding element to be coupled, at least one rim extending





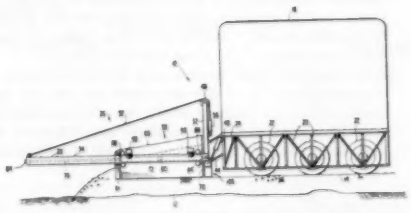
more than 180° around the corresponding element to be coupled.

4,440,520

ICE AGGREGATE ROAD AND METHOD AND APPARATUS FOR CONSTRUCTING SAME

Edwin N. Fisher, Belle Center, Ohio, assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 8, 1980, Ser. No. 176,554
Int. Cl.³ E01C 3/06
U.S. Cl. 404—72 **43 Claims**



27. A method of continuously constructing an ice aggregate road in cold climates using a machine that supports, transports and distributes ice aggregate and bond water and grades distributed aggregate, comprising the steps of:

(a) crushing ice to form an ice aggregate which includes fines;

(b) screening said ice aggregate to remove substantially all of said fines from said aggregate;

(c) placing the resulting ice aggregate in the machine;

(d) positioning said machine adjacent a first area over which said road is desired to be formed;

(e) distributing and grading said resulting ice aggregate over said first area with said machine;

(f) applying bond water to the top surface of said resulting ice aggregate in said first area with said machine;

(g) moving said machine onto the freshly bonded ice aggregate in said first area; and

(h) repeating steps (d) through for a second area adjacent said first area.

4,440,521

METHOD TO DISTRIBUTE WEAR FROM PASSING VEHICLES OVER A ROAD SURFACE

Sven R. V. Gebelius, Drottningholmsvägen 195, Bromma, Sweden (S-161 36)

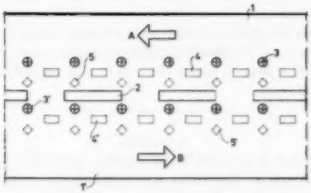
PCT No. PCT/SE81/00159, § 371 Date Jan. 25, 1982, § 102(e) Date Jan. 25, 1982, PCT Pub. No. WO81/03513, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 2, 1981, Ser. No. 354,089

Claims priority, application Sweden, Jun. 4, 1980, 8004173

Int. Cl.³ E01F 9/00

U.S. Cl. 404—72 11 Claims



1. A method of evenly distributing the wear from passing vehicles over the surface of a road comprising:

applying to the surface of each lane of traffic of said road a first plurality of linearly spaced first marks extending in the direction of traffic flow;

directing vehicles using said lane so that all wheels on a given side of every vehicle pass over said first marks, and when said first marks are substantially worn off;

applying to the surface of each lane of traffic of said road a second plurality of linearly spaced second marks extending in the direction of traffic flow, the line of said second marks being laterally displaced in relation to said first marks; and

directing vehicles using said lane so that all wheels on the given side of every vehicle pass over said second marks.

4,440,522

HYDRAULIC CONTROL ARRANGEMENT FOR A ROOF SUPPORT UNIT OF A MINERAL MINING INSTALLATION

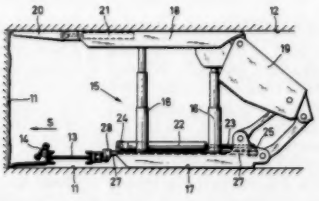
Michael Dettmers, Kamen, and Walter Weirich, Dortmund, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Dec. 19, 1980, Ser. No. 217,968

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002818

Int. Cl.³ E21D 15/14, 23/00, 23/16; F15B 11/20

U.S. Cl. 405—293 17 Claims



1. A hydraulic control arrangement for a roof support unit of a mineral mining installation, the hydraulic control arrangement comprising: a first hydraulic ram, a second hydraulic ram, a third hydraulic ram, and a metering ram, each of the first, second and third hydraulic rams having a pair of pressure chambers positioned on opposite sides of a respective reciprocable piston, the metering ram being hydraulically interposed between said first hydraulic ram and said second and third hydraulic rams in an arrangement such that the amount of hydraulic fluid supplied to one of the pressure chambers of each of the second and third hydraulic rams is dependent upon the amount of hydraulic fluid expelled from one of the pressure chambers of the first hydraulic ram during the working stroke of the first hydraulic ram, the metering ram having a reciprocable piston with first and second metering chambers and a working chamber on one side thereof, and a high pressure chamber on the opposite side thereof, said first and second metering chambers being connected respectively to the said one pressure chambers of the second and third hydraulic rams, said working chamber being connected to the said one pressure chamber of the first hydraulic ram, and said high-pressure chamber being connected to a hydraulic high-pressure line.

4,440,523

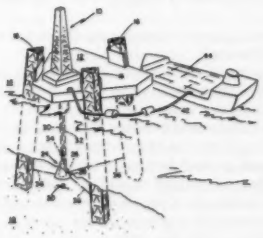
SEPARATING COLLECTOR FOR SUBSEA BLOWOUTS

Jerome H. Milgram, Arlington, and James Burgess, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 16, 1983, Ser. No. 505,051

Int. Cl.³ E02B 17/00; E02D 23/00

U.S. Cl. 405—60 11 Claims



1. A collector apparatus for use with a blown-out seabottom wellhead, said apparatus comprising a

collector means having an extended, open base and an upper portion enclosing a volume to receive fluid comprising gas and lesser quantities of oil rising, in the water, from the wellhead,

and a conduit-defining riser means connected to said collector means and extending thereabove to conduct said fluid therefrom

said apparatus characterized in that said collector means comprises

a plurality of collector elements, each having an extended, open base,

a first said collector element disposed below at least a second said collector element with an open volume defined therebetween,

said first collector element positioned to intercept said fluid rising from said wellhead,

and said second collector element positioned to receive and collect excess flow of said rising fluid that is not collected by said first collector element,

said riser means comprising at least a first conduit-defining riser extending from said first collector element to the surface of the sea, and a second conduit-defining riser extending from said second collector element to a storage means above said second collector element

said first riser including an adjustable valve means adapted to restrict flow through said riser whereby only a portion of gas from said blown-out wellhead is allowed to flow through said first riser and a further portion of gas and oil are rejected by said first collector element and flow into said second collector element,

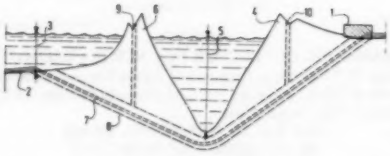
said second riser adapted to conduct gas in a gas-lift pumping flow rate capable of carrying water and accompanying oil from said second collector element to said storage means.

4,440,524

PROCESS FOR BRINGING A BODY OF WATER INTO COMMUNICATION WITH A TUNNEL

Louis Le Therisien, Paris, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed May 13, 1981, Ser. No. 263,384
Claims priority, application France, May 16, 1980, 80 10997
Int. Cl.³ F16L *1/04*; E21D *10/16*
U.S. Cl. 405—154 **12 Claims**



1. A process for establishing communication between an end of a length of pipe and a body of overlying water, comprising the steps of:

(a) excavating an elongate tunnel (**8**) under the bed of said body of water,

(b) excavating an underground cavity (**11**) beneath an end portion of said tunnel adjacent said body of water, said cavity having a volume at least equal to the volume of the ground (**12**) located between the bed of said body of water and the end portion of said tunnel above said cavity, said volume of ground forming a roof of said cavity,

(c) installing a length of pipe (**7**) in said tunnel such that an end of the length of pipe is disposed at said end portion of said tunnel at an entrance to said cavity,

(d) installing a chamber (**60**) in said cavity for protecting devices for the head of an underground well,

(e) installing a removable roof (**61**) over said chamber,

(f) constructing at least one leaktight shield (**16**) between the wall of said tunnel and said length of pipe at a position remote from said cavity, and

(g) collapsing the volume of ground forming said roof into said cavity such that the end of said length of pipe becomes immersed in and thus openly communicates with said body of water.

4,440,525

DIVERS WEIGHT BELT

Henry L. Peria, Orlando, Fla., assignor to H.I.M. Inc., Orlando, Fla.

Filed Dec. 2, 1981, Ser. No. 326,542
Int. Cl.³ B63C *11/30*
U.S. Cl. 405—186 **8 Claims**

1. A diver's weight belt comprising:

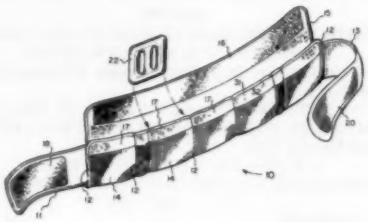
a belt having an outer surface and an inner surface, said inner surface worn toward the diver's body, said belt formed from cushioned material and having a length sufficient to reach around a diver's waist;

a plurality of pockets attached to said belt, said pockets formed from said cushioned material;

diving weights disposed in said pockets;

a single pad formed from said cushioned material and upwardly extending from said pockets and folded back and over said belt in a manner to close said pockets, said folded pad disposed along said inner surface of said pad thereby forming a double cushion between said diving weights and a diver's body and forming means for preventing accidential loss of said weights during use of said belt;

closure means attached to said pad and to said inner surface of said belt for holding said pockets closed when said pad is folded over said pockets; and



belt ends having belt buckling means associated with each end thereof, said buckling means adapted to close said belt around a diver's waist with said pad in contact with a diver's body.

4,440,526

ROCK ANCHORING ARRANGEMENT

Manfred Koppers, Duisburg; Karlheinz Bohnes, Bochum, and Bernhard Stephan, Gelsenkirchen, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhütte Heintzmann GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 332,358
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047709
Int. Cl.³ E21D *21/00*
U.S. Cl. 405—260 **21 Claims**

1. An anchoring arrangement adapted to be inserted into and held by a body of hardenable material in a bore provided in a support structure, especially in a rock formation encountered in tunnel and mine construction, particularly such involving a considerable convergence, comprising a sleeve centered on an axis and having a leading end and a trailing end as considered in the direction of insertion thereof into the bore; a mounting plate arranged at said trailing end of said sleeve and adapted to contact the support structure around the bore; an elongated anchoring rod having a trailing end portion at least partially accommodated within said sleeve and having a predetermined cross-sectional area, a leading end portion of a smaller cross-sectional area than said trailing end portion extending beyond said leading end of said sleeve into the bore, and a transition region situated between said leading and trailing end portions, at least said trailing end portion and transition region being of

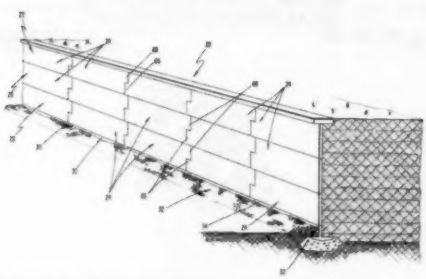
a yieldable material; and at least one drawing die secured to said sleeve at said leading end and having an aperture of a cross-sectional configuration corresponding to that of said anchoring rod at said transition region, said drawing die deforming said yieldable material at said transition region when said sleeve and anchoring rod are subjected to opposite axial forces tending to pull said anchoring rod out of said sleeve, to achieve gradual drawing of said transition region and trailing end portion of said anchoring rod through said drawing die when the magnitude of said axial forces exceeds a predetermined level.

4,440,527

MARINE STRUCTURE

Henri C. Vidal, 8 bis Blvd. Maillot, 92200 Neuilly sur Seine, France

Filed Sep. 22, 1981, Ser. No. 304,625
Int. Cl.³ E02D *29/02*
U.S. Cl. 405—284 **7 Claims**



1. A method of erecting a wall in a wet environment, comprising the steps of:

installing a course of footer panels in a submerged location;

placing a course of wall panels on the footer panels, said wall panels having a plurality of reinforcing members hingedly attached thereto;

depositing a layer of particulate material behind the course of wall panels;

swinging said reinforcing members from a generally vertical position with respect to the placed wall panel to a generally horizontal position with respect to the placed wall panel having engagement with said layer of particulate material; and

repeating the placing, depositing and swinging steps until the wall reaches the desired height.

6. An assembly suitable for use in erecting walls in a wet environment comprising:

a wall panel fashioned from reinforced concrete, having a pair of reinforcing members embedded therein;

a pair of members, one end of each member being securely attached to a corresponding one of the reinforcing members, the second end of each member projecting from the wall panel and having an aperture, the apertures of the members being in alignment;

an elongated metal strip provided with a connector end having an aperture therethrough;

pin means passing through the apertures of the pair of members and through the aperture of the connector end, including means for preventing disengagement of the pin means from the apertures, and the pin means being operable to pivotally connect the metal strip to the wall panel so that upon placement of the wall panel the metal strip can be lowered into position; and

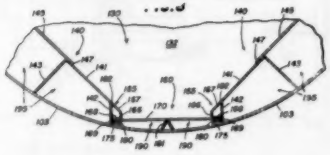
including a plurality of elongated metal strips, each strip having associated therewith corresponding pair of members and corresponding pin means.

4,440,528

CONTAINER FOR PULVERULENT MATERIAL

Erling Mowatt-Larssen, Warren, and Edward L. Davis, Youngstown, both of Ohio, assignors to General American Transportation Corporation, Chicago, Ill.

Division of Ser. No. 202,762, Oct. 31, 1980, abandoned. This application Aug. 27, 1982, Ser. No. 412,071
Int. Cl.³ B65G *53/38*
U.S. Cl. 406—90 **10 Claims**



8. A porous slide assembly for mounting in a trough disposed in the bottom of a storage chamber for pulverulent material with a plenum chamber beneath said porous slide assembly for receiving air to fluidize pulverulent material reposing upon said slide, said porous slide assembly comrising spaced-apart mounting bars in the bottom of said storage chamber extending longitudinally thereof, an elongated porous element having articulated clamping bars secured only thereto along the edges thereof, said clamping bars being laterally spaced apart a distance so as to lie freely on the outer sides of said mounting bars to stretch the elongated porous element between said mounting bars, and frame members overlying the edges of said elongated porous element and secured only to the walls of the associated storage chamber above the trough, each of said frame members having a first portion overlying said porous element along the perimeter thereof and cooperating with said clamping bars securely to mount said porous element in a position enclosing the bottom of the trough and contacting the adjacent portion of the pulverulent material therein, each of said frame members having a second portion disposed between said clamping bars and the walls of the associated storage chamber in engagement with both for laterally retaining said clamping bars and rigidifying said first portion, thereby to hold said clamping bars in the proper relationship with respect to said mounting bars and thus to mount said elongated porous element within the associated storage chamber.

4,440,529

METHOD AND MEANS FOR OPERATING A DRILL FOR ELIMINATING AXIAL SCRATCHES DURING RETRACTION

Samuel P. Henslee, Idaho Falls, Id.; Pascal J. Noronha, Loveland, Ohio, John B. Logan, Fort Worth, Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Continuation of Ser. No. 965,625, Dec. 1, 1978, abandoned. This application Apr. 30, 1981, Ser. No. 258,920
Int. Cl.³ B23B *45/04, 45/14*
U.S. Cl. 408—1 R **9 Claims**

1. A method of operating a drill of the type having two motors for rotating a drill bit, means for feeding said drill bit forward while said two motors are operated for drilling a hole in a workpiece, and means for moving said drill bit rearward for retracting said drill bit from the hole, said method comprising the steps of:

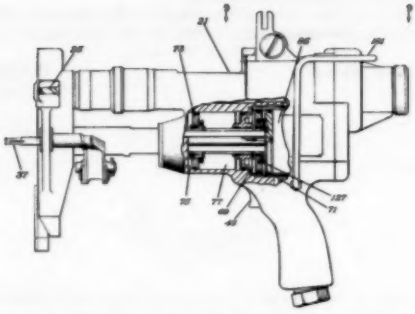
operating said two motors for rotating said drill bit,

while said two motors are being operated to rotate said drill bit, feeding said drill bit forward to drill a hole in the workpiece,

after the hole is drilled, moving said drill bit rearward at a constant and known rate to retract said drill bit from the hole,

while said drill bit is being retracted from the hole, operating only one of said motors to rotate said drill bit,

said drill bit being moved rearward and rotated at rates respectively during retraction such that the ratio V_L/V_R is less than 0.22, where V_L is the linear velocity of said



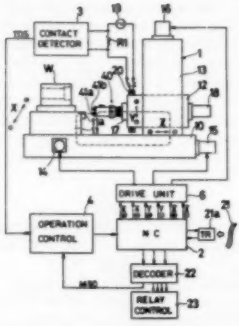
drill bit at its axis during retraction and V_R is equal to the product of the radius of said drill bit and its angular velocity during retraction.

4,440,530

MACHINE TOOL WITH TOOL POSITION COMPENSATING APPARATUS AND CONTACT DETECTING APPARATUS

Tetsuro Yamakage, Anjo, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 11, 1981, Ser. No. 301,208
Claims priority, application Japan, Sep. 11, 1980, 55-126789
Int. Cl.³ B23B *39/08, 39/24*
U.S. Cl. 408—3 **8 Claims**



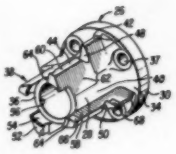
1. A machine tool comprising:
a machine body;
a work table mounted on said machine body for mounting thereon a workpiece to be machined;
a spindle head mounted on said machine body;
a tool spindle rotatably supported in said spindle head;
feed means for effecting relative movements between said work table and said tool spindle;
feed control means connected to said feed means for controlling said feed means in accordance with feed pulses and axis designation signals;
a tool holder receivable in said tool spindle;
a cutting tool supported on said tool holder;
a pair of engaging members axially slidable received in said tool holder, one end of each of said engaging members extending from one end of said tool holder and being engageable with said work table;
a compensating cam member rotatably supported in said tool holder to be rotated in one direction to extend said cutting tool outwardly in the radial direction when one of said engaging members is moved inwardly relative to said tool holder, and to be rotated in the other direction to retract said cutting tool inwardly in the radial direction when the other engaging member is moved inwardly relative to said tool holder;
means for detecting contact between said work table and said engaging members and said compensating cam member and outputing a detection signal; and
control means responsive to said detection signal output from said detecting means for causing said feed control means to effect relative movement between said work table and said tool spindle by an amount which is required to adjust the radial position of said cutting tool.

4,440,531

REAMING AND COUNTERBORING CUTTING TOOL

William H. Astle, Rancho Cordova, Calif., assignor to Tri Tool Inc., Rancho Cordova, Calif.

Filed Mar. 23, 1982, Ser. No. 361,115
Int. Cl.³ B23B *41/10;* **B23P** *15/26*
U.S. Cl. 408—82 **2 Claims**



1. A rotary reaming and counterboring tool for use with an axially extending mandrel comprising:
a central tool body extending axially along the tool rotary axis, the body including a proximal and distal end, said proximal end including a generally radially extending portion transversely larger than said distal end;
a plurality of longitudinally and radially extending lands on said central body between its proximal and distal ends, and straight flutes between the lands;
axial apertures extending through the transversely larger portion of the proximal end between the lands;
said lands each comprising longitudinally and radially stepped, generally trapezoidal cross sectional elements having, with respect to the rotational cutting direction, a flat radial forward face; a peripheral outer edge; and a rear face intersecting the rear end of said outer face and inclined away from said front face in a direction towards the central body;
said lands each having distal end portions projecting axially beyond said central body, and terminating at distal end surfaces;
each land having a radially larger portion located towards the proximal end of the central body, the intersection of the smaller and larger portions of each land constituting a longitudinally and radially stepped area including a radial end surface;
first and second forward facing radial cutting edges located respectively at the distal end and stepped area of each land; and
the distal and stepped end surfaces of each land being cut behind each cutting edge to provide clearance angles for the respective cutting edges;
said central body including a mandrel receiving bore extending completely therethrough along the rotary axis of the central body;
said lands each including, at their axially projecting distal ends, inner surfaces spaced radially outwardly from the diameter of said bore;

said land forward faces each including radius cuts adjacent each cutting edge;

said land rear faces comprising flat surfaces intersecting said central body in the flute area;

an undercut section disposed where each radial end face at said stepped area intersects the smaller land portion;

said radially extending proximal end portion of said central body comprising a mounting flange having a greater transverse dimension, e.g., diameter, than said larger portions of said lands; and

said outer circumferential edge of each land being raked radially inwardly adjacent each cutting edge for clearance.

4,440,532

DRILL BIT FOR DRILLING HOLES IN COMPOSITE FIBER/RESIN LAMINATES

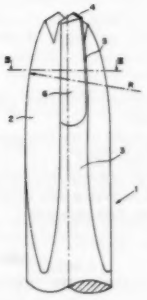
Sebastiano D'Apuzzo, Naples, Italy, assignor to Aeritalia Societa Aerospaziale Italiana p.A., Naples, Italy

Filed Jul. 20, 1981, Ser. No. 284,839

Claims priority, application Italy, Aug. 1, 1980, 49404 A/80

Int. Cl.³ B23D *77/14*; B23B *41/00*; B26D *1/00*

U.S. Cl. 408—229 **4 Claims**



1. A drill bit for drilling a hole in a composite material comprising a plastic laminate incorporating graphite carbon or glass fibers, said bit comprising an odd number of cutting elements, each including a first straight cutting edge and a second curved cutting edge, and having an axis about which said bit is rotated for drilling a hole, each of said cutting elements comprising:

a first quadrilateral face lying on a place forming a low conicity angle with said axis, a first side of said quadrilateral face being oriented in a direction so as to cross said axis and forming said first cutting edge, said first cutting edge terminating at a distance from said axis;

a second face and a third face, each having a side common to said first face and forming a dihedral angle therebetween, the edge of said dihedral angle running from said first straight cutting edge to a point on said axis opposite to an end of the bit with reference to said first straight cutting edge whereby the sides common to said third and second faces of adjacent cutting elements meet at said point on the axis of the bit;

and said second curved cutting edge angularly merging with said first straight cutting edge, said second cutting edge having a curved profile lying in a plane crossing said axis, with a radius three- to four-fold the diameter of the bit, said second cutting edge being defined by the intersection of a solid of revolution having a surface of said radius and a cylinder having an axis parallel to said axis of the bit and tangential to a point at which said first and said second cutting edges meet, whereby a concave cylinder profile is formed between a pair of adjacent cutting elements.

4,440,533

DEBURRING TOOL

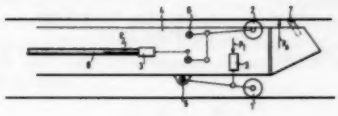
Otto Götting; Walter Hess, and Franz Nicolai, all of Mülheim-Ruhr, Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 378,688

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119943

Int. Cl.³ B23D *1/10*

U.S. Cl. 409—299 **2 Claims**



1. A tool for deburring the inside wall of welded tubes, including a tool body on which is mounted a cutter, the tool further comprising:

a lower roller linked to the body and being subjected to a constant force by a means for urging the lower roller against the tube wall;

an upper roller;

linkage means, including a rod that is accessible externally to a tube when the tool is inserted in the tube, the linkage means further being connected to the upper roller to urge the upper roller at variable pressure forces against the tube wall; and

means for measuring the pressure differential effective between the upper roller and the lower roller.

4,440,534

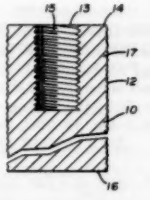
CERAMIC INSERT

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Division of Ser. No. 251,319, Apr. 6, 1981, Pat. No. 4,391,434, which is a continuation-in-part of Ser. No. 123,369, Feb. 21, 1980, Pat. No. 4,262,885. This application Jun. 7, 1982, Ser. No. 385,892

Int. Cl.³ F16B *13/04*; C21B *7/14*

U.S. Cl. 411—82 **1 Claim**



1. A ceramic insert for incorporation in a refractory article, the insert comprising a cylindrical body member of uniform diameter having a cavity axially inwardly of one end thereof and extending no more than half the axial distance of said body member, a thread pattern formed in the area of the body member defining said cavity, said insert formed of a mixture of

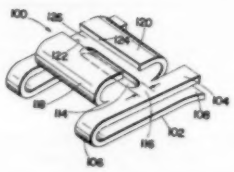
81.5% by weight Mulcoa brand refractory mix containing 60% aluminum oxide, 5% pure aluminum oxide (Al_2O_3) and 13.5% raw fire clay together with 18.5% by weight phosphoric acid (H_3O_4P) so that the pure aluminum oxide will react with the phosphoric acid to precipitate as a hard salt bonding the ceramic insert to the refractory article when said refractory article is baked, a rough surface on the exterior of said cylindrical body arranged to engage said refractory article in non-slip relation when said insert is embedded therein prior to said baking.

4,440,535

SHEET METAL FASTENER

Donald N. Oehlke, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 14, 1981, Ser. No. 263,526
Int. Cl.³ F16B *37/04*
U.S. Cl. 411—112 **5 Claims**



1. A one-piece, self-retaining sheet metal fastener for substantially fixed mounting to a panel having a slotted aperture therethrough and for receiving and retaining a rotationally tightened externally threaded fastener, said sheet metal fastener formed from a strip of sheet metal the thickness of which is less than the pitch distance of the external threads of the externally threaded fastener, said sheet metal fastener comprising generally parallel leg and base portions joined by bight portion for resilient receipt of an edge of the panel therebetween, said base portion being generally flat and defining a first thread engaging elongated slot therethrough, said first slot defined by a pair of substantially parallel substantially straight first edges spaced apart by a distance less than the major diameter of the externally threaded fastener, a pair of arm portions extending upwardly and then inwardly from opposite edges of said base portion, said arm portions terminating at opposed substantially parallel substantially straight second edges spaced apart by a distance less than the major diameter of the external threads of the externally threaded fastener to define a second thread engaging elongated slot therebetween, said second thread engaging slot spaced from and generally aligned with said first thread engaging slot.

4,440,536

METHOD AND DEVICE FOR POSITIONING AND GUIDING PIPE IN A DRILLING DERRICK

Orville C. Scaggs, P.O. Box 430, Lindsey, Okla. 73052

Continuation-in-part of Ser. No. 42,001, May 24, 1979, Pat. No. 4,274,777, and Ser. No. 931,150, Aug. 4, 1978, abandoned. This application Apr. 30, 1981, Ser. No. 258,933
Int. Cl.³ E21B *19/14*
U.S. Cl. 414—22 **7 Claims**

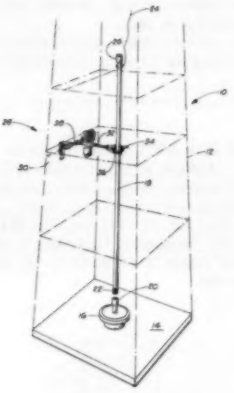
1. A method of coupling a first pipe joint to a second pipe joint in a drilling derrick having a work table, comprising the steps of:

positioning by moving in a vertical arc a mechanical arm in the derrick so that a pipe-receiving slot of the arm can receive the upper end of a first pipe joint at a location linearly above a second pipe joint disposed in the work table section of the derrick;

locking said mechanical arm such that said pipe-receiving slot is immobile in a position linearly above said second pipe joint;

swinging the upper end of a pipe joint so that it is received in the pipe-receiving slot of the arm;

enclosing the slot with a closure member so that the upper end of the pipe positioned in the slot is retained linearly above the second pipe joint;



swinging the lower end of the first pipe joint adjacent to the second pipe joint;

coupling the lower end of the first pipe joint to the upper end of the second pipe joint;

opening the slot by moving the closure member; and

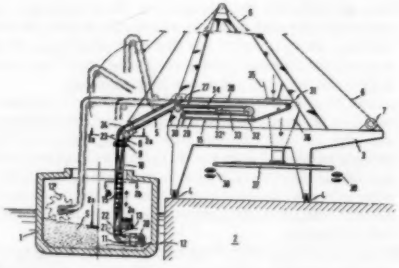
moving the pipe receiving slot of the arm away from the upper end of the first pipe joint.

4,440,537

CONVEYOR SYSTEM

Karl-Günther Blättermann, Hamburg-Rahlstedt, and Jürgen Paelke, Tostedt, both of Fed. Rep. of Germany, assignors to Conrad Scholtz AG, Hamburg, Fed. Rep. of Germany

Filed Jan. 13, 1982, Ser. No. 339,158
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3101515; Jan. 28, 1981, 3102731
Int. Cl.³ B65G *63/00*
U.S. Cl. 414—139 **10 Claims**



1. In a conveyor system for loading or unloading bulk material into and from large containers, particularly ships, and including a gantry, boom means having one end thereof mounted on said gantry for pivotal movement of said boom means about a horizontal axis in a vertical plane, a leg means adapted to extend from one end thereof downwardly from generally the other end of said boom means along a vertical

axis, means for pivotally connecting the other end of said boom means to the one end of said leg means while allowing said leg means to maintain its vertical orientation regardless of the position of said boom means and for rotating said leg means about the vertical axis relative to said boom means, and conveyor belt means movably carried by said gantry, said boom means and said leg means for conveying the bulk material between the other end of said leg means and said gantry; the improvements in combination therewith, characterized by providing a simplified construction of said conveyor system for providing both loading and unloading operations and eliminating the necessity of plural conveyor belts, of:

said conveyor belt means comprising a single flexible continuous conveyor belt having inner and outer sides and defining conveying and returning segments extending between said gantry and the other end of said leg means, spaced-apart flexible corrugated walls mounted on said conveyor belt and extending generally outwardly from said outer side generally along and inwardly of the outer edges of said conveyor belt, and a plurality of spaced-apart cleat means mounted on said conveyor belt and extending generally outwardly from said outer side transversely between said corrugated walls for defining with said conveyor belt and said corrugated walls bucket-shaped compartments for conveying the bulk material;

separate spaced-apart guide means respectively carried by said connecting means and by said leg means at generally the other end thereof for receiving, guiding and maintaining each of the conveying and returning segments of said conveyor belt at the locations of said guide means in predetermined desired positions and planes relative to each other regardless of the rotational position of said leg means;

said conveyor belt being unrestrained between said guide means for allowing said flexible conveyor belt to twist therebetween with rotation of said leg means relative to said boom means; and

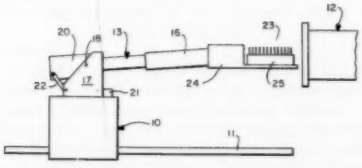
means for selectively driving said conveyor belt in forward and reverse directions for loading and unloading bulk material.

4,440,538

APPARATUS FOR LOADING AND UNLOADING A FURNACE

Gerald M. Bowers, Boonville, Calif., assignor to Atomel Products Corporation, Sunnyvale, Calif.

Filed Dec. 30, 1981, Ser. No. 335,853
Int. Cl.³ H01L *21/324*
U.S. Cl. 414—183 **3 Claims**



1. An apparatus for loading and unloading a furnace with wafers held in a boat carried by a boat carrier including a support assembly movable horizontally on an axis parallel to the loading axis of said furnace, a ram mounted on said support assembly and movable relative to said support assembly on an axis lying in the same plane as the loading axis of said furnace, portions of said ram adapted to enter said furnace being formed of inert material with respect to conditions in said furnace, said ram being tiltable in a vertical plane from a position with its long axis horizontal to a position with the end of said ram most distant from said support assembly at a higher elevation than the end of said ram nearer said support assembly, engaging means on the end of said ram formed to engage said boat carrier when said ram is in a tilted position and to disengage from said boat carrier when said ram is in a horizontal position, wherein the improvement in said apparatus comprises:

said engaging means being formed with an end having upwardly facing and downwardly facing surfaces formed to engage opposed surfaces of said boat carrier, said upwardly facing and downwardly facing surfaces being spaced apart and engaging said opposed surfaces on said boat carrier at substantially point contacts relative to said axis of loading of said furnace;

said end of said engaging means being further formed and dimensioned for removal from engagement with said boat carrier without contacting said boat carrier except at said point contacts; and

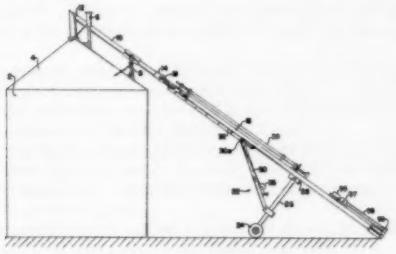
said ram being formed and dimensioned for insertion into and for removal of said ram and boat carrier from said furnace and for insertion into and removal of said end from said boat carrier without contact of said ram with said furnace.

4,440,539

METHOD AND APPARATUS FOR CONVEYING PARTICULATE MATTER

Thomas J. Sullivan, P.O. Box 5119, 220 Nesbitt St., Poland, Ohio 44514

Filed Feb. 1, 1982, Ser. No. 344,367
Int. Cl.³ B65G *65/32*
U.S. Cl. 414—300 **10 Claims**



1. Apparatus for conveying particulate material from a lower elevation to a location of higher elevation, said location being situated substantially centrally with respect to the roof of a container of substantial dimension, said apparatus comprising, in combination,

a first enclosed-auger section having a receiving end and a delivery end,

means for mounting said first section upon said roof,

means for aligning the discharge end of a second enclosed-auger section with said receiving end of said first section,

a portable second enclosed-auger section of substantial length, said second section having a feed end and a delivery end,

means for releasably securing said delivery end of said second enclosed-auger section to said first section, and

drive means for the auger in said second section, the second auger section having a drive-transfer means for driving the auger in said first section.

4,440,540

APPARATUS FOR LIFTING A WHEELCHAIR ONTO THE ROOF OF AN AUTOMOBILE

David Gottlieb, 15 Devorah Hanevia St., and Eliezer Zer, 6 Amos St., both of Bnei Brak, Israel

Continuation-in-part of Ser. No. 880,572, Feb. 23, 1978, Pat. No. 4,236,860. This application Dec. 1, 1980, Ser. No. 211,913

Int. Cl.³ B60R *9/00*

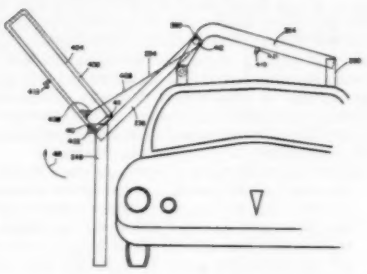
U.S. Cl. 414—462 **2 Claims**

1. A device for selectively positioning a mobility aid appliance for an invalid onto an automobile comprising:

(a) a fixed support apparatus mountable onto the roof of an automobile, and defining a fixed track;

(b) an axle arranged for rotational rolling engagement with said track and movement therealong;

(c) a mobility aid appliance support shaft means, said shaft means comprising first and second shaft elements which are extensible with respect to each other, said shaft means further defining first and second ends, said first end being rotatably mounted onto said axle, and said second end being associated with a mobility aid appliance for support



thereof, said second shaft element defining said second end; and

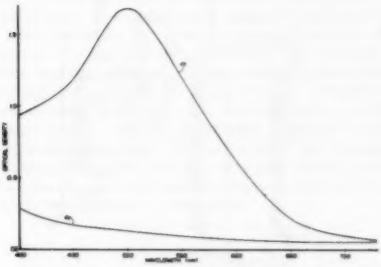
(d) a cover rotatably mouned onto said second shaft element.

4,440,541

POLARIZER: DICHROIC DYE IN ORIENTED POLYACRYLIC ACID/CHITOSAN COMPLEX SHEET

Carl M. Berke, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 20, 1982, Ser. No. 380,054
Int. Cl.³ D06P 7/00
U.S. Cl. 8—489 **6 Claims**



1. A dichroic light polarizer comprising a molecularly oriented sheet of a polyacrylic acid/chitosan polyelectrolyte complex dyed with a dichroic dye.

4,440,542

CONTROLLED DELIVERY OF IMMISCIBLE MATERIALS INTO AN AQUEOUS SYSTEM

Lary L. Foley, San Francisco, Calif., assignor to The Clorox Company, Oakland, Calif.

Filed Sep. 18, 1981, Ser. No. 303,472
Int. Cl.³ A61K 7/46
U.S. Cl. 8—523 **7 Claims**

1. An article for controllably releasing water immiscible components into an aqueous system consisting essentially of a silica-silicate water soluble foam and the water immiscible components adsorbed upon said foam.

4,440,543

METHOD FOR STABILIZING A SLURRY OF FINELY DIVIDED PARTICULATE SOLIDS IN A LIQUID

J. Paul Echtler, Pittsburgh, Pa., assignor to Conoco Inc., Wilmington, Del.

Continuation of Ser. No. 152,073, May 21, 1980, abandoned. This application Aug. 10, 1981, Ser. No. 291,596
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 **2 Claims**

1. A method of providing stability of particle distribution and redispersibility in the transporting and combusting of coal in combustible liquid comprising the steps as follows:

storing a readily pumpable, readily redispersible slurry of solids mixture in a combustible liquid which is neither a pseudo-plastic nor a thixotropic fluid, said liquid not being highly viscose such as methanol said solids mixture comprising from about 90 to about 99 weight percent coal particles and from about 1 to about 10 weight percent finely divided wood particles,

said wood particles being of a size less than the largest coal particles and each having a particle size no larger than about 50 Tyler mesh (297 microns),

pumping said readily pumpable and redispersible solids mixture in said combustible liquid as a slurry with substantially no fibrous matrix being formed and said wood particles remaining discrete as a stable dispersible slurry,

injecting said stable dispersible slurry through a nozzle means for fine dispersion in a combustion zone, combusting said slurry.

4,440,544

PROCESS FOR THE CONVERSION OF GROUND HYDROUS LIGNITE INTO A PUMPABLE DEHYDRATED SUSPENSION OF FINE-GROUND LIGNITE AND OIL

Friedrich Honolke; Adrian Brandl; Eduard Schibilla, and Gerhard Hohne, all of Dortmund, Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed May 21, 1982, Ser. No. 380,998
Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120602
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 **13 Claims**

1. A method for producing a pumpable suspension in oil of dehydrated, finely-ground lignite, said method comprising the steps of:

(a) mixing hydrous, ground lignite with an oil which has a vapor pressure less than ½ bar at a temperature in the range of 190° to 240° C. and a diluent for the oil, said diluent being inert with respect to and miscible with the oil being effective to produce a solution with the oil which has a viscosity lower than that of the oil, being immiscible with water, and having a vapor pressure greater than 1 bar at a temperature in the range of 190° to 240° C.;

(b) controlling the proportions of the lignite, of the oil and of the diluent so that the mixture, when the lignite is ground so that substantially all the particles thereof are finer than 2 mm, is a pumpable suspension;

(c) grinding the lignite in the mixture so that substantially all the particles thereof are finer than 2 mm;

(d) heating the suspension to a temperature in the range of 190° to 240° C.;

(e) subjecting the suspension to a pressure in the range of 30 to 80 bar;

(f) partially dehydrating the lignite therein by maintaining the suspension at a temperature within the range of 190° to 240° C. and at a pressure in the range of 30 to 80 bar for at least 5 minutes;

(g) after the partial dehydration step, separating the suspension into a slurry of partially dehydrated lignite and oil and a liquid composed principally of water, diluent and oil;

(h) separating water from the liquid of step (g) and mixing the oil and diluent which remain with the slurry of partially dehydrated lignite and oil from step (g) to produce a suspension of partially dehydrated lignite;

(i) reducing the pressure of the suspension of partially dehydrated lignite to one in the range of 1 to 18 bar while maintaining the temperature thereof at one in the range of 190° to 240° C.; and

(j) separating water and the diluent from the suspension of step (i), leaving a dehydrated lignite suspension in oil.

4,440,545

GASOHOL HAVING CORROSION INHIBITING PROPERTIES

Charles F. Weidig, Grosse Pointe, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 2, 1981, Ser. No. 317,574
Int. Cl.³ C10L 1/18
U.S. Cl. 44—56 **5 Claims**

1. A liquid fuel for use in internal combustion engines comprising a major amount of hydrocarbons boiling in the gasoline boiling range, a minor amount of ethanol, and a corrosion inhibiting amount of tetrapropenylsuccinic acid or anhydride.

4,440,546

PROCESS FOR GASIFICATION OF CARBONACEOUS MATERIAL

Michael S. Lancet, Pittsburgh, Pa., and Everett Gorin, San Rafael, Calif., assignors to Conoco Inc., Wilmington, Del.

Continuation of Ser. No. 305,588, Sep. 25, 1981, abandoned. This application Mar. 14, 1983, Ser. No. 474,911
Int. Cl.³ C10J 3/14, 3/16
U.S. Cl. 48—202 5 Claims

1. A process for producing a tar free gaseous product comprising hydrogen and carbon monoxide by catalyzed gasification of bituminous coal consisting of the steps as follows:

(a) providing a mixture consisting essentially of finely divided bituminuous coal particles of a size of 65 mesh or smaller than 65 mesh and finely divided calcium oxide particles of a size smaller than 100 mesh, said calcium oxide and said bituminuous coal being in intimate contact and in a weight ratio of about 0.5 to 1.0, said bituminous coal having the property of becoming liquid with sufficient heating, and said bituminous coal yielding tar when sufficiently heated,

(b) briquetting said mixture to form a briquetted mixture,

(c) feeding said briquetted mixture into the top of a fixed bed gasifier,

(d) catalytically gasifying said briquetted mixture with steam in said gasifier to form gaseous mixture comprising tar, carbon dioxide, hydrogen and carbon monoxide, said hydrogen and said carbon monoxide each comprising a substantial portion of said gaseous mixture,

said gasifying comprising

(i) heating said briquetted mixture of finely divided coal and finely divided calcium oxide in said fixed bed gasifier to form a catalyzed coke, said catalyzed coke reacting with said added steam to form said gaseous mixture and,

(ii) adding steam to said gasifier,

(e) destroying said tar in a tar destruction zone at the top of said gasifier to form a tar free gaseous product, by operating said tar destruction zone above 1200° F., the heat for tar destruction being provided by exothermic reaction of said calcium oxide and said carbon dioxide, said tar free gaseous product comprising hydrogen and carbon monoxide each in substantial proportion,

whereby said calcium oxide catalyzes said gasification to form said tar free gaseous product, the rate of said catalyzed gasification being substantially increased from the rate of uncatalyzed gasification of said bituminuous coal, said tar being eliminated by sufficient heat of reaction of said calcium oxide and said carbon dioxide to maintain said tar destruction zone above 1200° F. to cause destruction of said tar during gasification.

4,440,547

ALUMINA COATED SILICON NITRIDE CUTTING TOOLS

Vinod K. Sarin, Lexington, and Sergej-Tomislav Buljan, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 20, 1982, Ser. No. 380,363
Int. Cl.³ B24D 11/00
U.S. Cl. 51—295 11 Claims

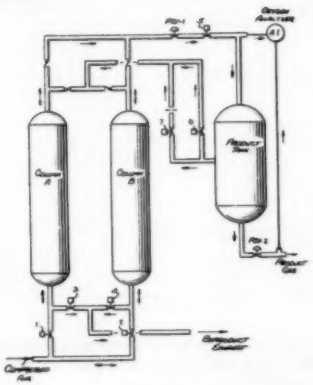
1. A coated ceramic cutting tool comprising a densified silicon nitride substrate body having at least one adherent coating layer; said substrate body consisting essentially of a first phase of silicon nitride and a refractory second phase comprising silicon nitride and an effective amount of a densification aid selected from the group consisting of silicon dioxide, aluminum oxide, magnesium oxide, yttrium oxide, hafnium oxide, zirconium oxide, the lanthanide rare earth oxides, and mixtures thereof; said adherent coating layer consisting essentially of aluminum oxide.

4,440,548

PRESSURE SWING ABSORPTION SYSTEM

Joel D. Hill, Tulsa, Okla., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Apr. 19, 1982, Ser. No. 369,694
Int. Cl.³ B01D 53/04
U.S. Cl. 55—26 15 Claims



1. A molecular sieve, pressure swing adsorption process employing at least two columns for generating an enriched gas which comprises the sequential steps of:

(a) passing a pressurized gas mixture at an adsorption pressure sufficient to support a pressure swing cocurrently through a first adsorption column of molecular sieves thereby generating enriched gas, said gas flowing to a product tank;

(b) prior to breakthrough of said first column, partially pressurizing a second adsorption column of molecular sieves by passing a small fraction of enriched gas from said product tank countercurrently to said second column, thereafter stopping said gas mixture flow to said first column;

(c) partially venting said first adsorption column countercurrently, flowing the vented gas cocurrently to said second adsorption column (bottoms equalization), thereafter isolating said first column;

(d) substantially simultaneously with step (c), passing said gas mixture cocurrently to said partly pressurized second column, thereby fully pressurizing said second column to the adsorption pressure;

(e) countercurrently fully venting said isolated first column to atmospheric pressure while passing the gas mixture cocurrently through said pressurized second column thereby generating enriched gas, said enriched gas flowing to said product tank;

(f) regenerating said first column by countercurrently purging said first column with enriched gas from the product tank;

(g) repeating the sequence of steps (a)–(f) treating said second column as said first column and vice versa.

11. An apparatus for the fractionation of a gas mixture, said apparatus comprising a pressure swing adsorption unit having:

(a) at least two pressure resistant housings for molecular sieve adsorbent, each housing having an inlet and an outlet;

(b) a pressure resistant product gas housing having one inlet and at least two outlets;

(c) a main gas mixture inlet;

(d) a purge gas/waste gas outlet;

(e) a first connecting means between said main gas mixture inlet and each of said molecular sieve housings inlets;

(f) a second connecting means between said product gas

housing inlet and each of said molecular sieve housings outlets;

(g) a third connecting means between said purge/waste gas outlet and each of said molecular sieve housings inlets;

(h) a fourth connecting means between one of said product gas housing outlets and each of said molecular sieve housings outlets;

there being a valve in each connecting means, said valves being arranged such that said molecular sieve housings are connected in a parallel gas flow arrangement, said valves being connected to a valve control means whereby gas flow in said unit is controlled by the opened or closed position of said valves such that said apparatus is capable of a continuous cycle between said two pressure resistant molecular sieve housings comprising the steps of (1) adsorption; (2) countercurrent venting between molecular sieve housing inlets; (3) product gas purge from said product gas housing; (4) partial repressurization with product gas from said product gas housing; (5) partial cocurrent repressurization using gas vented countercurrently from one molecular sieve housing; (6) final repressurization with feed gas and (7) adsorption.

4,440,549

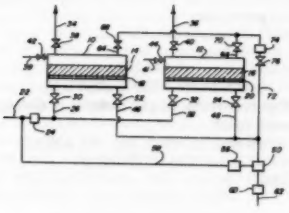
METHOD FOR REDUCING PEAK VAPOR EMISSIONS IN SOLVENT RECOVERY SYSTEMS

Maurice V. Girard, Chateauneuf de Grasse, France; Michael J. Worrall, Hinsdale, and Bernard R. Seguy, Lisle, both of Ill., assignors to AMCEC Corporation, Oak Brook, Ill.

Filed Apr. 13, 1982, Ser. No. 367,950

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—59 **5 Claims**



1. The method of reducing peaks in water vapor and solvent emission levels during cooling and drying of an adsorber container following the termination of steam scrubbing of the adsorber container in a system for recovering solvents from solvent laden gas comprising the steps of:

terminating the flow of steam through said adsorber container to end said steam scrubbing operation;

initiating a flow of solvent laden gas through said adsorber container to begin said cooling and drying operation;

recirculating the flow of solvent laden gas from said adsorber container back to an input of said solvent recovery system;

maintaining said recirculating flow until the emission level in the gas leaving said adsorber container reaches a predetermined level;

terminating said recirculating flow and discharging the flow of gas from said adsorber container to the atmosphere.

4,440,550

ON-COLUMN INJECTOR

Rand G. Jenkins, Roseville, and Norman W. Wohlers, Davis, both of Calif., assignors to J & W Scientific, Inc., Rancho Cordova, Calif.

Filed Jun. 28, 1983, Ser. No. 508,742

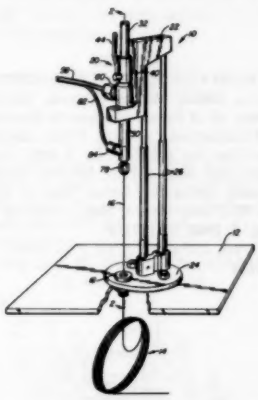
Int. Cl.³ B01D *15/08*

U.S. Cl. 55—67 **10 Claims**

7. A method for introducing a sample into a capillary column located within the oven of a gas chromatograph, said method comprising:

maintaining an initial portion of the column outside of the oven;

continuously flowing a carrier gas through the column;



injecting the sample into the initial portion of the column; and

abruptly inserting the intitial portion of the column into the oven.

4,440,551

METHOD FOR THE ADSORPTIVE REMOVAL OF HYDROGEN SULFIDE FROM GAS MIXTURES

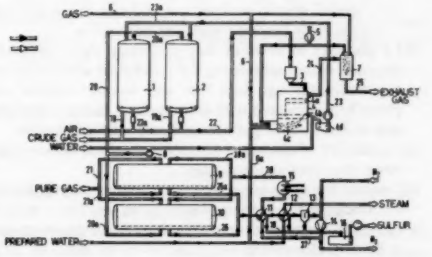
Klaus-Dirk Henning; Jürgen Klein, both of Essen, and Burkhard Harder, Hattingen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,515

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029187

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—73 **4 Claims**



1. Method for the adsorptive removal of hydrogen sulfide from gas mixtures in carbon containing absorption agents by adsorption at pressures between 1–80 bar and regeneration, by pressure lowering and/or temperature change while simultaneously rinsing with a nonadsorbable or only negligibly adsorbable component of the gas mixture in an adsorption reactor, characterized in that a molecular carbon containing screen is used, made of fossil and/or critical bituminous fuel with at pore diameter smaller than 10 nm measured by methanol adsorption pore volume of 15–25 $cm^3/100$ g and micropore volume in the pore diameter range of 0.35–10 nm is smaller than 10 $cm^3/100$ g, wherein an inner surface of said molecular

screen is relieved from surface groups which are capable of reacting with the H_2S by means of an aftertreatment with a reducing gas.

4,440,552

ELECTROSTATIC PARTICLE PRECIPITATOR

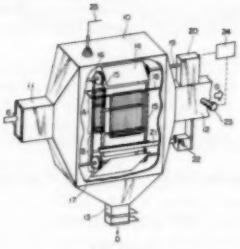
Tsuneo Uchiya, Abiko; Hiroaki Yabuta, Toride, and Seizi Hikizi, Iruma, all of Japan, assignors to Hitachi Plant Engineering & Construction Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 240,609, Mar. 5, 1981, abandoned. This application Aug. 6, 1982, Ser. No. 405,872

Claims priority, application Japan, Mar. 6, 1980, 55-27368; Mar. 6, 1980, 55-27369; Mar. 6, 1980, 55-28272; Mar. 6, 1980, 55-27367; Aug. 6, 1980, 55-107118

Int. Cl.³ B03B *3/10, 3/36, 3/74*

U.S. Cl. 55—114 **9 Claims**



1. An electrostatic particle precipitator for removing dust particles from a flue gas moving along a predetermined path, at least a portion of said dust particles having an electric resistance of at least $10^{13}\Omega$cm, said precipitator comprising:

(a) a casing having:

(1) an inlet for receiving a flue gas,

(2) an outlet for exhausting a flue gas from the casing after passing therethrough,

(3) a first region disposed in direct alignment of gas flow between said inlet and outlet, and

(4) a second region disposed out of direct alignment with the gas flow between said inlet and outlet;

(b) a plurality of rows of dust collecting plate electrodes disposed within said casing for movement alternately and repeatedly through said first and second regions, said plates being oriented with their surfaces facing perpendicular to the flow of gas between said inlet and outlet;

(c) a plurality of discharge electrodes disposed between said rows of collecting electrodes;

(d) means for applying a voltage between said discharge electrodes and collecting electrodes in said first region to cause the electrostatic precipitation of said dust onto said collecting electrodes;

(e) dust removing mean disposed in said second region for removing accumulated dust from said collecting electrodes; and

(f) control means for controlling the speed of movement of the collecting electrodes through said regions relative to the rate of removal of dust effected by the dust removing means for maintaining the accumulated layer thickness of dust on said collecting electrodes at a level at which the electric intensity gradient in the accumulated layer is below that at which a reverse ionization zone is generated inhibiting further accumulation of said dust with an electric resistance of at least $10^{13}\Omega$cm on said collecting plates.

4,440,553

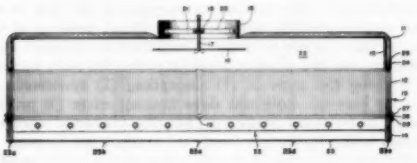
AIR-FILTRATION MODULE WITH IONIZATION FOR ELIMINATION OF STATIC ELECTRICITY

Martin C. Helmus, 2525 Knollview, SW., Wyoming, Mich. 49509, and Wallace L. Baker, 4505 Hersman, SE., Grand Rapids, Mich. 49506

Filed Jun. 5, 1982, Ser. No. 365,556

Int. Cl.³ B03B *3/01, 3/70*

U.S. Cl. 55—126 **1 Claim**



1. An air-filtration module having a housing provided with air-inlet means and an open outlet end; a filter element secured to said housing in said open end, said housing defining a space between said air-inlet means and said filter element; and grille means fixed with respect to said housing and defining an outlet for air emerging from said filter element, said grille means and filter element being spaced from each other in said housing to define a space free of filtration material, wherein the improvement comprises:

an electrostatic ionization generator fixed with respect to said housing and interposed between said filter element and said grille means, said filter element and said grille means being formed of grounding material components so as to provide ground potential on opposite sides of said ionization generator.

4,440,554

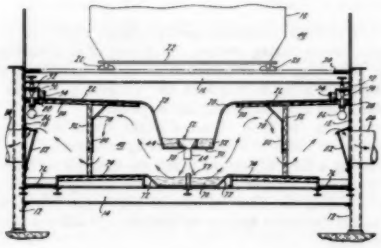
GAS SCRUBBING DEVICE

Geoffrey A. Perry, Livonia, Mich., assignor to Gallagher-Kaiser Corp., Detroit, Mich.

Filed Sep. 30, 1982, Ser. No. 430,327

Int. Cl.³ B01D *47/00*

U.S. Cl. 55—241 **16 Claims**



1. A gas scrubbing device comprising a first chamber for receiving a stream of gas containing entrained particulate matter, a second chamber separated from said first chamber by an angularly inclined flood sheet formed with a trough having a base along the lowermost portion thereof, a plurality of frames disposed in said trough defining communicating openings between said first and second chambers, a venturi removably disposed on each frame comprising a pair of downwardly and inwardly inclined side walls and end walls formed at their lower edges with an inwardly extending opposed lip defining therebetween a venturi throat, each said venturi removably supported by each said frame in a substantially horizontal position and with the upper edge thereof spaced upwardly from the base of said trough, means for providing a pressure differential between said first and second chambers to induce

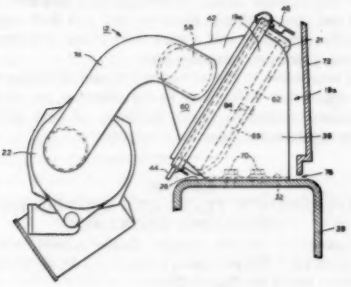
flow of gas from said first chamber through said venturi into said second chamber, and means for discharging a continuous sheet of liquid over said flood sheet for flow toward and into said trough and overflow as a continuous curtainous stream into each said venturi for atomization along said lip of said throat by the gas stream passing therethrough.

4,440,555

ENGINE COMPARTMENT AND AIR CLEANER

Willard L. Chichester, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 20, 1982, Ser. No. 380,201
Int. Cl.³ B01D *46/10*; F02B *77/00*
U.S. Cl. 55—385 B 11 Claims



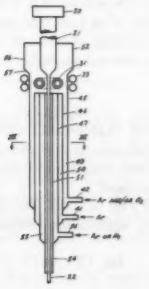
1. An engine compartment for a vehicle in combination with an air cleaner housing, said engine compartment comprising two side frame members, one of said side frame members having a horizontally disposed upper surface, said air cleaner housing having an inlet portion and an outlet portion, said inlet portion comprising a bottom wall secured to said upper surface and two end walls and including an inlet opening for admitting air into said air cleaner housing, said outlet portion comprising an air outlet opening for directing air from said housing to the engine carburetor, a flat air filter mounted in said housing at an acute angle with said bottom wall, and said filter being sealed around its periphery to said outlet portion.

4,440,556

OPTICAL FIBER DRAWING USING PLASMA TORCH

Shin M. Oh; Dilip K. Nath, both of Roanoke, and Pablo C. Pureza, Burke, all of Va., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,273
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—2 27 Claims



19. A method of heating a portion of a preform from which an optical fiber is to be drawn in a fiber-drawing operation, comprising the steps of

maintaining an atmosphere of plasma-forming gaseous medium in a heating zone surrounding said portion of the preform; and

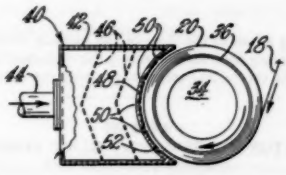
exciting in the atmosphere present in the heating zone a ring-shaped plasma circumferentially surrounding said portion of the preform.

4,440,557

METHOD AND APPARATUS FOR FORMING AND COLLECTING CONTINUOUS GLASS FILAMENTS

Michael W. Morrison, Newark; Clarence E. Fracker, Jr., Frazeysburg, and Jerome F. Marra, Heath, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 20, 1982, Ser. No. 450,941
Int. Cl.³ C03B *37/12*
U.S. Cl. 65—3.1 24 Claims



9. The method of forming and collecting glass filaments comprising:

supplying streams of molten glass to be drawn into filaments;

rotating a member to draw said streams into filaments and to wind said filaments therearound in layers;

applying a coating to said filaments advancing toward said member;

directing a planar flow of gas into severly oblique contact with the outer layer of said strand along the length thereof to penetrate and at least partially remove the boundary layer of air associated with the rotating layer; and

directing a body of gas into contact with the outer strand layer along the length thereof to at least partially dry the coating on said filaments.

4,440,558

FABRICATION OF OPTICAL PREFORMS BY AXIAL CHEMICAL VAPOR DEPOSITION

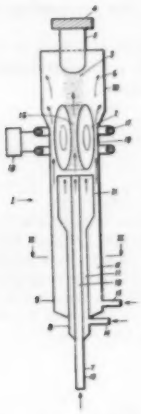
Dilip K. Natn, Roanoke; Pablo C. Pureza, Burke, and Shin M. Oh, Roanoke, all of Va., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 387,983
Int. Cl.³ C03B *19/06*, *37/025*
U.S. Cl. 65—3.12 24 Claims

1. A method of producing an optical preform, comprising the steps of forming a flow of a heated gaseous medium through and beyond a heating zone, including inducing a ring-shaped plasma in the heating zone for heating the gaseous medium to a predetermined temperature;

introducing only into the center of the ring-shaped plasma at least one reactant capable of undergoing a chemical conversion into an optical material soot at the predetermined temperature for the soot to be formed in, and entrained in

the flow of the gaseous medium for travel beyond, the heating zone; and



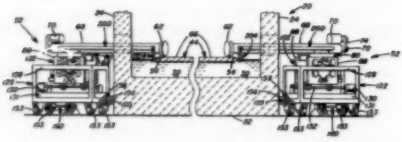
disposing a bait in the flow of the gaseous medium beyond the heating zone for depositing the entrained optical material soot on the bait and thus growing the optical preform.

4,440,559

APPARATUS FOR SENSING A GLASS RIBBON EDGE AND METHOD OF USE

Hugh E. Shaw, Jr., Crystal City, Mo., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 30, 1982, Ser. No. 393,912
Int. Cl.³ C03B *18/06*
U.S. Cl. 65—99.5 **13 Claims**



1. A method of measuring sideward displacement of a glass ribbon supported on a molten metal bath contained in a chamber having sidewalls and advancing along a ribbon movement path, comprising:

advancing edge detecting means in a first direction away from the adjacent chamber sidewall into physical contact with a ribbon edge wherein the measuring path is transverse to the ribbon movement path;

moving the edge detecting means in a second direction along the movement path away from the ribbon edge toward the chamber sidewall into a first home position;

at a selected interval repeating said advancing step;

practicing said moving step to move the edge detecting means away from the ribbon edge into a second home position;

determining the distance and direction along the measuring path between the first and second home positions to measure sideward displacement of the advancing ribbon.

8. An apparatus for measuring substrate displacement comprising:

means for detecting substrate edge, said detecting means including:

block means having at least one orifice;

means for moving a fluid under a predetermined pressure out of the at least one orifice;

means mounting said moving a fluid means for controlling the fluid flow out of said orifice when said block means contacts the substrate edge wherein the fluid moves out of said orifice at a first pressure and wherein said controlling means includes a member pivotally mounted on said block means for movement toward and away from said orifice; and

means for measuring variations in pressure to determine when the ribbon edge is contacted;

means for moving said detecting means to advance said detecting means in a first direction along a measuring path into contact with the substrate edge, and to retract said detecting means in a second direction along the path a predetermined distance into a home position, said means for moving said detecting means including a pipe having said block means of said detecting means mounted at one end and connectable at the other end to a fluid supply;

means for activating said means for moving said detecting means at selected intervals; and

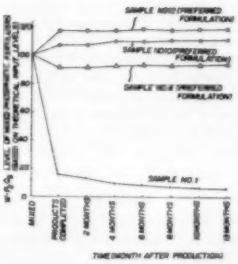
means responsive to the movement of said detecting means for measuring differences in the distance and direction between successive home positions of said detecting means to measure substrate displacement.

4,440,560

MIXED PHOSPHATIC FERTILIZER AND PROCESS FOR PRODUCING THE SAME

Teruo Nakamura; Michio Kiyoto; Kazuo Akashi, and Isao Hasegawa, all of Tokyo, Japan, assignors to Japan Metals and Chemicals Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 185,741, Sep. 10, 1980, abandoned. This application Dec. 22, 1981, Ser. No. 333,441
Claims priority, application Japan, Dec. 13, 1979, 54-161841
Int. Cl.³ C05B *21/00*
U.S. Cl. 71—24 **1 Claim**



1. A mixed phosphatic fertilizer obtained by adding and mixing from about 17.65 to about 100 parts by weight of humic acid with 100 parts by weight of a mixture of about 80 to 98% by weight of fused phosphate as a main component and about 20 to 2% by weight of at least one compound selected from a specific group consisting of calcium superphosphate, calcium triple-superphosphate and phosphoric acid.

4,440,561

DEFOLIANT COMPOSITION AND METHOD

Jacques Meyer, Zofingen, and Walter E. Schären, Vordemwald, both of Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

Filed Feb. 3, 1982, Ser. No. 345,490
Claims priority, application Switzerland, Feb. 19, 1981, 1101/81
Int. Cl.³ A01N *37/40*
U.S. Cl. 71—70 **9 Claims**

1. A composition suitable for controlled pre-harvest defoliation and/or desiccation of crop plants comprising, in a synergistic combination, the constituents:

(1) methyl-5-(2,4-dichlorophenoxy)-2-nitrobenzoate;
(2) 3-(3,4-dichlorophenyl)-1-methoxy-1-methyl urea; and
(3) a mineral oil;
said composition containing said constituents (1) and (2) in a weight ratio of from 1:6.25 to 6.25:1 and said constituent (3) being contained in said composition in an amount of from about 0.8 to about 3.2 parts, by weight, per each part, by weight, of the total amount of said constituents (1) and (2).

4,440,562

HERBICIDAL EMULSIONS

Erhard J. Prill, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 20, 1981, Ser. No. 285,166
Int. Cl.³ A01N *25/08, 25/22*
U.S. Cl. 71—86 **8 Claims**

1. A herbicidal emulsion composition consisting essentially of the following components:
A. from about 10.0 to about 25.0 percent by weight of the isopropylamine salt of N-phosphonomethylglycine;
B. from about 2.0 to about 12.5 percent by weight of a surfactant for Component A;
C. from about 20.0 to about 35.0 percent by weight of 2-chloro-2',6'-diethyl-N-(methoxymethyl) acetanilide;
D. From about 1.25 to about 1.75 percent by weight of an organophilic clay;
E. from about 4.5 to about 9.0 percent by weight of an emulsifier selected from the group consisting of alkyl aryl sulfonates, phosphate esters of nonyl phenol ethoxylates and polyalkyleneglycol ethers;
F. from about 10.0 to about 20.0 percent by weight of an organic solvent in which 2-chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide herbicide is soluble, which is nonreactive to said herbicide and which is essentially water-insoluble; and
G. balance being made up of water.

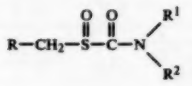
4,440,563

THIOLCARBAMATE SULFOXIDES STABILIZED WITH BUTYROLACTONE AND WATER

Herbert B. Scher, Moraga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 24, 1980, Ser. No. 190,155
Int. Cl.³ A01N *43/00*
U.S. Cl. 71—88 **10 Claims**

1. A liquid herbicidal composition comprising a combination of
(a) about 1 to about 30 percent by weight of a thiolcarbamate sulfoxide of the formula



in which
R is alkyl C_1–C_7, haloalkyl C_1–C_5, alkoxy C_1–C_5 and phenyl;
R^1 and R^2 independently are alkyl C_1–C_6, cycloalkyl C_3–C_8, alkenyl C_2–C_6 and alkynyl C_2–C_4; or
R^1 and R^2 together with the nitrogen atom to which they are attached form piperidino, hexamethyleneimino, decahydroquinolyl, 2,5-dimethylpiperidino and 5-ethyl-2-methylpiperidino; and
(b) about 99 to about 70 percent by weight of a mixture of water and butyrolactone, in a ratio of about 0.10 to about 3.0 parts by weight water per 1.0 part by weight butyrolactone.

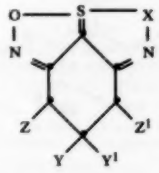
4,440,564

HETEROCYCLIC PENTALENES AS HERBICIDES

Michael T. Clark, and Ian J. Gilmore, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 388,777, Jun. 15, 1982, abandoned. This application Sep. 15, 1982, Ser. No. 418,369
Claims priority, application United Kingdom, Jun. 24, 1981, 8119403
Int. Cl.³ A01N *43/02*
U.S. Cl. 71—90 **2 Claims**

1. A method for controlling unwanted plant growth at a locus, which comprises treating the locus with an effective dosage of a compound of the formula:



wherein X is O or S, and Z, Z^1, Y and Y^1 each is hydrogen or alkyl of from one to three carbon atoms.

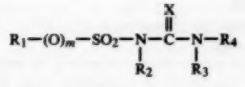
4,440,565

HETEROCYCLICALLY SUBSTITUTED (HALOGENO)ALKYL- AND (HALOGENO)ALKOXYSULFONYLUREAS, AND THEIR USE IN AGRICULTURE

Lothar Willms, Unkel; Hilmar Mildenberger; Dieter Günther, both of Kelkheim; Klaus Bauer, Rodgau; Helmut Bürstell, Frankfurt am Main, and Hermann Bieringer, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,489
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111451
Int. Cl.³ C07D *251/46, 251/52;* A01N *43/66, 43/70*
U.S. Cl. 71—93 **13 Claims**

1. A compound of the formula



wherein R_1 is an alkyl, alkenyl or alkadienyl radical which has up to 10 C atoms, is optionally substituted by up to 6 halogen atoms, and can be interrupted by oxygen, R_2 and R_3 are H or (C_1–C_4)-alkyl, X is O or S, m is O or 1 and R_4 is a six-membered 1,3,5-triazine mono- or di-substituted by halogen, NO_2, CN, CHO, (C_1–C_4)-alkylamino, (C_1–C_4)-dialkylamino or a combination thereof; (C_1–C_4)-alkyl optionally substituted by halogen, (C_1–C_3)-alkoxy, (C_1–C_3)-alkylthio, (C_1–C_3)-alkylamino, (C_1–C_3)-dialkylamino, (C_1–C_4)-alkoxycarbonyl or a combination thereof; (C_1–C_4)-alkoxy or (C_1–C_4)-alkylthio optionally substituted by halogen, (C_1–C_4)-alkoxycarbonyl or a combination thereof; (C_1–C_4)-alkoxycarbonyl, or a combination thereof; and, if R_2 is hydrogen, a physiologically tolerated salt thereof with a base.

3. A plant growth regulating composition comprising a concentration of a compound defined in claim 1 that is effective to regulate plant growth and an inert carrier material therefor.

4,440,566
HERBICIDAL SUBSTITUTED 2-(1-(OXYAMINO)-ALKYLIDENE)-CYCLOHEXANE-1,3-DIONES

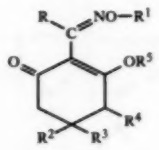
Tatao Luo, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 405,228, Aug. 5, 1982, abandoned, which is a continuation of Ser. No. 210,206, Nov. 25, 1980, abandoned. This application Aug. 9, 1982, Ser. No. 406,423

Int. Cl.[3] **C07C** *131/00*; **A01N** *31/06, 33/24*

U.S. Cl. 71—98 **24 Claims**

1. A compound of the formula



wherein

R is alkyl of 1 to 6 carbon atoms or phenyl;

R^1 is haloalkenyl of 2 to 6 carbon atoms and 1 to 3 halogen atoms, p-halobenzyl or p-trifluoromethylbenzyl;

R^2 and R^3 are independently hydrogen, alkyl of 1 to 3 carbon atoms, alkylthio of 1 to 6 carbon atoms, or alkylthioalkyl of 2 to 8 carbon atoms;

R^4 is hydrogen, or carbalkoxy of 2 to 4 carbon atoms;

R^5 is hydrogen, a cation, or

wherein R^6 is alkyl of 1 to 6 carbon atoms, phenyl or naphthyl.

22. A method of killing vegetation which comprises applying to said vegetation or its growth environment a herbicidally effective amount of a compound of the formula defined in claim **1**.

4,440,567
COMPOSITION OF MATTER

Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 28, 1983, Ser. No. 470,111

Int. Cl.[3] **A01N** *37/34*; **C07C** *121/75*

U.S. Cl. 71—105 **3 Claims**

1. The composition of matter, α-cyanobenzyl-3,6-dichloro-2-methoxybenzoate.

2. A herbicidal composition comprising an inert carrier and, as an essential ingredient in a quantity toxic to weeds, the compound of claim **1**.

4,440,568
BORON ALLOYING ADDITIVE FOR CONTINUOUSLY CASTING BORON STEEL

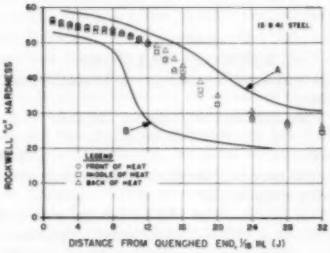
John O. Staggers, Downingtown; Samir K. Banerji, Norristown, and Michael J. Lalich, Downingtown, all of Pa., assignors to Foote Mineral Company, Exton, Pa.

Filed Jun. 30, 1981, Ser. No. 279,079

Int. Cl.[3] **C21C** *7/00*; **C22C** *30/00*

U.S. Cl. 75—53 **31 Claims**

14. A method for the continuous casting of boron steel which comprises adding to the molten steel at least one addition agent having a high affinity for oxygen present in the steel in an amount sufficient to deoxidize the steel, introducing the deoxidized steel to a tundish provided with a nozzle through which the steel is continuously cast into a mold, and adding to the deoxidized steel prior to casting a boron alloying additive consisting essentially of from about 0.25 to about 3.0 percent boron, from about 2.5 to about 40 percent of at least one rare earth metal, from about 6 to about 60 percent titanium, up to about 75 percent silicon, up to about 10 percent calcium, up to about 5 percent zirconium, up to about 10 percent manganese, up to about 2 percent aluminum, and the balance iron, said percentages being by weight, based on the total weight of said additive, and the weight ratio of titanium to boron being from



about 20:1 to about 60:1, and the weight ratio of titanium plus rare earth metal to boron being from about 30:1 to about 90:1, the amount of boron alloying additive employed being such as to provide a steel with a boron content of from about 0.0005 to about 0.003 percent, and a titanium content of from about 0.035 to about 0.055 percent, said percentages being by weight of the steel.

4,440,569
RECOVERY OF ZINC FROM ZINC-CONTAINING SULPHIDIC MATERIAL

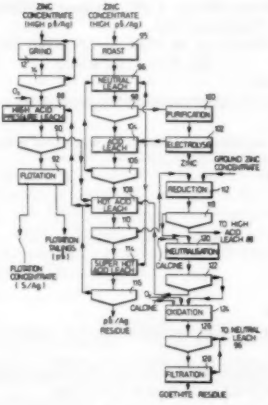
Donald R. Weir, and Ian M. Master, both of Fort Saskatchewan, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Feb. 22, 1983, Ser. No. 468,740

Claims priority, application United Kingdom, Feb. 24, 1982, 8205495

Int. Cl.[3] **C22B** *19/00, 15/00, 11/00*; **C01G** *49/02*

U.S. Cl. 75—120 **6 Claims**



1. A process for recovery zinc from zinc containing sulphidic material which also contains iron and at least one metal selected from the group consisting of lead and silver, the process comprising leaching the material under pressurized oxidizing conditions at a temperature in the range of from about 130° to about 170° C. in aqueous sulphuric acid solution with a stoichiometric acid excess of sulphuric acid relative to the zinc

content of the material of from about 40 to 100% to produce a first residue containing a major proportion of the said at least one metal and a first leach solution containing a major proportion of the zinc and iron, separating the first residue from the first leach solution, treating the first residue to recover values of said at least one metal, roasting zinc and iron containing sulphidic material to produce a zinc oxide and zinc ferrite containing material, leaching the zinc oxide and zinc ferrite containing material in a weak aqueous sulphuric acid solution to dissolve zinc oxide and produce a leach solution containing dissolved zinc and a zinc ferrite containing second residue, separating the zinc ferrite containing second residue from the second leach solution, recovering zinc from the second leach solution, leaching the zinc ferrite containing second residue in a strong aqueous sulphuric acid solution to dissolve zinc ferrite and produce a third leach solution containing dissolved zinc and iron and a third residue, said strong aqueous sulphuric acid solution comprising at least a portion of said first leach solution containing zinc and iron, separating the third residue from the third leach solution, reducing ferric iron in the third leach solution to ferrous iron, neutralizing the solution and hydrolyzing the ferrous iron under oxidizing conditions to precipitate an iron compound, and separating the iron compound from the remaining solution.

4,440,570

PROCESS FOR PURIFYING AND RECOVERING CONTAMINATED CATALYST SOLUTION OBTAINED IN THE CARBONYLATION OF METHYL ACETATE AND/OR DIMETHYLETHER

Heinz Erpenbach, Cologne; Klaus Gehrmann; Winfried Lork, both of Erftstadt, and Peter Prinz, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 402,961

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1981, 3134348

Int. Cl.³ C22B *11/00;* **C01G** *55/00;* **C07F** *9/54;* **C07D** *213/06*

U.S. Cl. 75—121 **7 Claims**

1. In a process for purifying and recovering constituents from a contaminated catalyst solution which is obtained as a result of the carbonylation of methyl acetate, dimethylether, or a mixture of methylacetate and dimethyl ether, the contaminated catalyst solution containing carbonyl compounds of noble metals of group VIII of the Periodic System of the elements, quaternary heterocyclic aromatic nitrogen compounds or quaternary organophosphorus compounds as organic promoters, undistillable organic contaminants, and volatile constituents, including acetic acid, acetic anhydride and ethylidene diacetate, the improvement which comprises: distillatively freeing the catalyst solution from the volatile constituents and water-treating the remaining solid distillation residue, the noble metal/carbonyl-compound being thereby precipitated together with the organic contaminants and the organic promoter becoming dissolved in water; removing the precipitated and contaminated noble metal/carbonyl-compound by filtration; recovering the noble metal therefrom; and recovering the organic promoter by evaporating the water.

4. In a process for purifying and recovering constituents from a contaminated catalyst solution which is obtained as a result of the carbonylation of methyl acetate, dimethylether, or a mixture of methylacetate and dimethylether, the contaminated catalyst solution containing carbonyl compounds of noble metals of group VIII of the Periodic System of the elements, quaternary heterocyclic aromatic nitrogen compounds or quaternary organophosphorus compounds as organic promoters, undistillable organic contaminants, and volatile constituents including acetic acid, acetic anhydride and ethylidene diacetate, the improvement which comprises: distillatively freeing the catalyst solution from the volatile constituents and water-treating the remaining solid distillation residue, the noble metal/carbonyl-compound being thereby precipitated together with the organic contaminants and the organic promoter becoming dissolved in water; removing the precipitated and contaminated noble metal/carbonyl-compound by filtration; recovering the noble metal therefrom; and recovering the organic promoter by extracting it with halogenated hydrocarbons and evaporating said halogenated hydrocarbons.

6. A process as claimed in claim 4 wherein 10 to 100 parts by weight water are used per part by weight distillation residue.

4,440,571

PROCESS FOR THE SURFACE TREATMENT OF INORGANIC FIBERS FOR REINFORCING TITANIUM OR NICKEL AND PRODUCT

Toshikatsu Ishikawa, Tokyo; Junichi Tanaka, Yokohama; Haruo Teranishi, Machida; Tatsuya Okamura, Kobe, and Tokuji Hayase, Chigasaki, all of Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1982, Ser. No. 395,231

Claims priority, application Japan, Jul. 10, 1981, 56-107721; Nov. 26, 1981, 56-188338

Int. Cl.³ B22F *1/00, 3/00*

U.S. Cl. 75—229 **6 Claims**

3. A process for the surface treatment of inorganic fibers for reinforcing titanium, comprising the steps of:

coating the surface of inorganic fibers selected from the group consisting of carbon fibers, alumina fibers, silicon carbide fibers, potassium titanate fibers, boron fibers and tungsten fibers, with an aqueous or organic solvent solution containing, in parts by weight, 1 part of a titanate, 1–5 parts of a borate, 0.1–0.9 parts of a tetraalkylammonium hydroxide and 0.7–2.7 parts of water or an organic solvent,

heat treating the thus coated inorganic fibers at 1300°1500° C., in an inert or non-oxidizing atmosphere, and then

ionically or chemically plating the thus heat treated inorganic fibers with nickel to form a nickel coating thereon thereby to obtain a surface treated inorganic fibers for reinforcing titanium.

6. Inorganic fiber-reinforced titanium or nickel produced by applying titanium in the foil or particulate form to the surface treated inorganic fibers obtained by the process of claim 3 and then molding the whole at a temperature of 800°–1000° C. and a molding pressure of 100–1000 Kg/cm^2 for 0.5–6 hours to compound the metal and the fibers with each other thereby obtaining the inorganic fiber-reinforced titanium or nickel.

4,440,572

METAL MODIFIED DISPERSION STRENGTHENED COPPER

Anil V. Nadkarni, Mentor, and Prasanna K. Samal, Lyndhurst, both of Ohio, assignors to SCM Corporation, New York, N.Y.

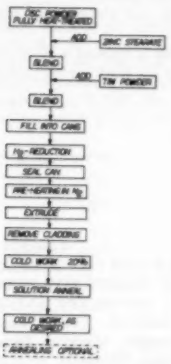
Filed Jun. 18, 1982, Ser. No. 389,605

Int. Cl.³ B22F *3/00;* **C22C** *1/05*

U.S. Cl. 75—232 **13 Claims**

1. A process for making a modified dispersion strengthened copper alloy which comprises blending a major amount of an unmodified pre-made dispersion strengthened copper powder containing a refractory metal oxide in an amount sufficient to strengthen the copper, and a minor amount of one or more

powdered modifying metals different from copper and alloyable therewith, and heating said blend to a temperature below



the melting point of copper and sufficient to alloy at least a part of said modifying metal or metals with said copper.

4,440,573

METHOD FOR PRODUCING DIAMOND COMPACT

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Apr. 23, 1982, Ser. No. 371,130
Claims priority, application Japan, Apr. 24, 1981, 56-61271
Int. Cl.³ B22F *3/00*; C22C *1/05*
U.S. Cl. 75—243 2 Claims

1. A method for producing a compact of diamond particles comprising providing a mass of diamond particles and a mass of infiltrant metallic material, each mass having a substantially identical surface area; positioning said mass of diamond particles and said mass of infiltrant metallic material such that said surfaces of substantially identical surface area are separated by a barrier layer of high melting metal having a surface area of 85% to 97% of the surface areas of said mass of diamond particles and said mass of infiltrant metallic material; subjecting said positioned masses and barrier layer to an elevated temperature-pressure condition within the diamond stability region of the carbon phase diagram but below the melting point of said metallic barrier layer, thereby allowing a regulated amount of molten infiltrant metal to flow around said barrier layer and throughout the mass of diamond particles to bond the said diamond particles to each other and recovering a compact of bonded diamond particles.

4,440,574

NONSLUDGING COMPLEXES OF CHROMIUM AND STEARIC ACID

Salvatore A. Bruno, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Feb. 22, 1983, Ser. No. 468,770
Int. Cl.³ C09K *3/18*
U.S. Cl. 106—2 1 Claim

1. A solution comprising a Werner Complex of stearato, Cr^{+3}, Cl and OH groups present in the approximate ratio of 1:2:4:1, respectively, said solution containing from 5–7 weight percent chromium, from 15–30 weight percent n-pentanol and from 47.7–32.7 weight percent isopropanol.

4,440,575

GRANULAR INSULATION PRODUCT AND PROCESS FOR ITS PREPARATION

Jean-Charles Daussan, 42 rue Saint-Marcel; Gerard Daussan, 9 avenue Leclerc de Hauteclocque, both of 57000 Metz, and Andre Daussan, 52 rue des Pepinieres, 57050 Longeville les Metz, all of France

Continuation-in-part of Ser. No. 156,392, Jun. 4, 1980, abandoned. This application Oct. 19, 1982, Ser. No. 435,309
Claims priority, application Monaco, Jun. 11, 1979, 1386
Int. Cl.³ 252 *62*; B28B *7/34*
U.S. Cl. 106—38.22 6 Claims

1. A method for the production of a granular heat insulating product to be spread on the free surface of a bath of molten metal contained in a metallurgical vessel, comprising the following steps:

introducing in a substantially vertical-axis cylindrical tank containing a vertical-axis blade, rice husk ash wetted with an aqueous suspension of paper pulp containing between 2 and 5% of paper pulp for enabling the wetted rice husk ash grains to roll on one another, rotating the blade at a speed of 40 to 300 rpm until spherical granules of a diameter in the range of from 0.5 mm to 5 mm are obtained, and drying the granules to less than 2% moisture content.

4,440,576

HYDRAULIC CEMENTS PREPARED FROM GLASS POWDERS

James E. Flannery; Joseph F. Mach, and Dale R. Wexell, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,030
Int. Cl.³ C04B *7/00*
U.S. Cl. 106—85 14 Claims

1. A hydraulic cement exhibiting high mechanical strength, long term durability against attack by water, and, after curing, essential freedom from creep, said cement composed of glass powders consisting essentially, expressed in terms of mole percent on the oxide basis, of about 60–76% SiO_2, 15–30% K_2O, and 2–15% total of at least one metal oxide selected from the group of 0–10% Al_2O_3, 0–5% V_2O_5, 0–5% TiO_2, 0–5% MoO_3, and 0–5% WO_3.

4,440,577

POLYHYDROXY POLYPHENYL COMPOUNDS AS ADDITIVES FOR CEMENTITIOUS MATERIALS

Alphonso W. Marcellis, Boonton, and Grannis S. Johnson, Plainfield, both of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Sep. 7, 1982, Ser. No. 415,018
Int. Cl.³ C04B *7/35*
U.S. Cl. 106—90 34 Claims

1. Water soluble residue obtained from resorcinol production by the alkaline fusion method having the following composition:

Resorcinol: about 2 to about 8% by wt.
Dihydroxy diphenyl: about 12 to about 20% by wt.
Trihydroxy diphenyl: about 25 to about 35% by wt.
Higher molecular weight polymers: balance

which has been sulfonated, sulfomethylated, sulfonated and condensed with formaldehyde, sulfomethylated and condensed with formaldehyde, co-condensed with ligninsulfonate and formaldehyde or co-condensed with aromatic sulfonic acid formaldehyde condensate and formaldehyde and their sodium, potassium, ammonium, aluminum and zinc salts.

4,440,578

METHOD AND APPARATUS FOR PROCESSING RAW MEAL HAVING A HIGH ALKALI CHLORIDE AND/OR SULFATE CONTENT

Darius A. Wadia, 96 Marine Dr., Bombay, India

Filed May 12, 1982, Ser. No. 377,320
Int. Cl.³ C04B 7/44
U.S. Cl. 106—100 10 Claims

1. A method for processing raw meal in an installation for calcination of granular, powdered limestone, aluminum hydrate, or the like including those having relatively high alkali chloride and/or sulfate content of up to 2% Cl and/or 2.5% SO_3, said method including the steps of metering dry raw meal into a processing apparatus, pumping said raw meal from said processing apparatus to a separate combustion chamber, supplying fuel to said combustion chamber and igniting same whereby said dry raw meal in said combustion chamber is heated to a temperature in the range between 100° C. and 600° C., pumping said heated dry raw meal to a cyclone separator, processing said dry raw meal through said cyclone separator to a long dry process rotary kiln, whereby the temperature of the gas exiting the cyclone separator is typically in the range of 150° C. to 200° C. above the temperature of said raw meal as it exits said combustion chamber (above 450° C.) and the thermal efficiency of said processing apparatus is improved.

4,440,579

AIR BLOWING ASPHALT USING SULFONIC ACID CATALYST

Penny K. Eidem, Point Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 30, 1982, Ser. No. 445,400
Int. Cl.³ C08L 95/00
U.S. Cl. 106—274 16 Claims

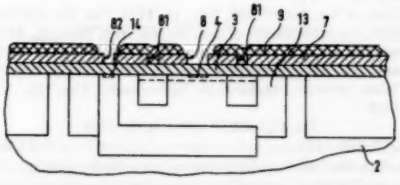
1. An asphalt composition comprising a catalytic amount of from about 0.25 weight percent to about 10 weight percent of asphalt soluble organic sulfonic acid, and asphalt in an amount to equal 100 weight percent.

4,440,580

METHOD OF FABRICATING AN INTEGRATED BIPOLAR PLANAR TRANSISTOR BY IMPLANTING BASE AND EMITTER REGIONS THROUGH THE SAME INSULATING LAYER

Hans-Juergen Gahle, Emmendingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 31, 1982, Ser. No. 364,156
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1981, 3115029
Int. Cl.³ H01L 21/265, 21/223, 21/72
U.S. Cl. 148—1.5 3 Claims



1. A method of fabricating an integrated bipolar planar transistor whose base region is formed by ion implantation through an insulating layer of a given thickness and composition of a first insulating material deposited on a semiconductor body, and whose emitter region is also formed by ion implantation, wherein the improvement comprises the steps of ion implanting the dopants of a first conductivity type for the emitter region through the same insulating layer as those for the base region forming a first photoresist mask layer having a selected opening; over the insulating layer, implanting ions of a second conductivity type into a portion of the surface of the semiconductor body below said opening, which portion is doped so as to be of the first conductivity type; removing the first photoresist mask layer; depositing an additional insulating layer made of a second material which is etchable selectively with respect to the first material; opening at least one window in the additional insulating layer at least where the emitter region is to be formed; covering the remaining portions of the additional insulating layer with a second photoresist mask layer; implanting ions of the first conductivity type into the semiconductor surface through the exposed portions of the insulating layer; removing the second photoresist mask layer; and activating the implanted ions during a post-diffusion process.

4,440,581

PROCESS FOR THE PRODUCTION OF VANADIUM CARBIDE COATINGS ON IRON

Ulrich Baudis, Hanau; Peter Biberbach, Rodenbach, and Wolfgang Weber, Karlstein, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,617
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3025033
Int. Cl.³ C23C 9/10
U.S. Cl. 148—6.11 9 Claims

1. A process for the production of a vanadium carbide layer on iron or an iron alloy having a carbon content of at least 0.1 weight% by a solid state reaction comprising treating a workpiece of the iron or iron alloy at a temperature of 800° to 1100° C. in a salt bath which contains 1–30 weight % of vanadium or ferrovandium powder, said salt bath consisting essentially of 50 to 100% barium chloride and a member selected from the group consisting of an alkaline earth metal halide, another alkali metal halide or a mixture of both an alkali metal halide and another alkaline earth metal halide.

4,440,582

PROTECTIVE COATING COMPOSITION AND METHOD OF USE THEREFOR

Noel A. Smith, and William J. Avallone, both of Troy, Mich., assignors to Saran Protective Coating Company, Detroit, Mich.

Filed Apr. 15, 1982, Ser. No. 368,718
Int. Cl.³ C10M 3/14
U.S. Cl. 148—6.15 R 21 Claims

1. An aqueous coating composition for improving corrosion resistance of metal parts, consisting essentially of:
(a) a phosphating oil,
(b) an aminofunctional alkylpolysiloxane or aminofunctional polyalkylsiloxane, and
(c) water.

4,440,583

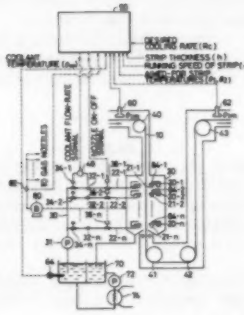
METHOD OF CONTROLLED COOLING FOR STEEL STRIP

Hiroshi Ikegami; Norichika Nagira, and Katsuhiko Yui, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 17, 1982, Ser. No. 442,431
Claims priority, application Japan, Jan. 11, 1982, 57-2584
Int. Cl.³ C21D 11/00
U.S. Cl. 148—128 1 Claim

1. In a method of controlledly cooling steel strip in a cooling apparatus of a continuous annealing line comprising a plurality of nozzles spraying a coolant against the hot strip arranged in the direction in which the strip travels and a flow-rate control valve provided in a coolant supply tube leading to said nozzles, the improvement which comprises calculating the heat transfer

rate necessary for obtaining a desired cooling rate by using an equation including the thickness of the strip, the cooling starting and finishing temperatures, and the desired cooling rate, correcting the obtained heat transfer rate according to the effect of natural cooling in idle-pass zones preceding and following the coolant spray zone, calculating and setting a coolant flow rate from an equation expressing the predetermined relationship between the heat transfer rate and coolant flow rate, calculating the length of the coolant spraying region in



the direction of strip travel from the running speed of the strip, the cooling starting and finishing temperatures, and the desired cooling rate, setting the nozzles to be turned on and off so that the coolant is ejected from such a number of nozzles as correspond to the calculated length of the spraying region, correcting the coolant flow rate by re-calculating the heat transfer rate on the basis of said settings when the strip thickness varies while being controlled-cooled, and correcting the on-off pattern of the nozzles by re-calculating the length of the spraying region when the strip running speed varies.

4,440,584

METHOD AND APPARATUS FOR COOLING STEEL SHEET

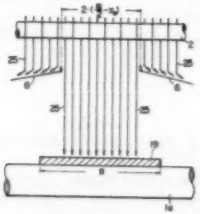
Kenji Takeshige; Kenji Hirabe; Yukifumi Ogawa; Kazuyoshi Arikata; Kazunori Yako, all of Fukuyama; Kenichi Sakai, Kasaoka; Toshinori Matsuo, Fukuyama, and Hiroshi Kamio, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1982, Ser. No. 406,932

Claims priority, application Japan, Aug. 21, 1981, 56-130222

Int. Cl.³ C21D *1/647, 9/573*

U.S. Cl. 148—128 **11 Claims**



1. In a method for cooling a steel sheet, which comprises:

ejecting cooling water onto a steel sheet laid horizontally from above and from below said steel sheet immediately after the completion of hot rolling to cool said steel sheet;

the improvement characterized by:

shielding each of the both side edge portions of the upper surface in the width direction of said steel sheet from said ejected cooling water by a shielding means movable in the width direction of said steel sheet so that the temperature distribution in the width direction of said steel sheet becomes uniform at the completion of the ejection of cooling water; and,

determining a shielding width of each of said both side edge portions of said steel sheet, which is shielded from said ejected cooling water, on the basis of the width and the thickness of said steel sheet, the temperature and the flow rate per unit area of cooling water ejected onto the upper and the lower surfaces of said steel sheet, the period of time from start to completion of the ejection of cooling water, and the temperature distribution in the width direction of said steel sheet immediately before the start of the ejection of cooling water.

4,440,585

AMORPHOUS MAGNETIC ALLOY

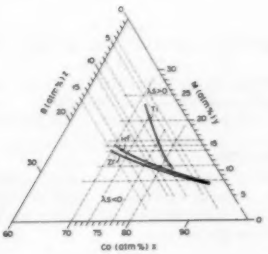
Jun Kanehira, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1983, Ser. No. 455,523

Claims priority, application Japan, Jan. 19, 1982, 57-6571; Mar. 12, 1982, 57-38999

Int. Cl.³ C22C *19/07*

U.S. Cl. 148—403 **6 Claims**



1. An amorphous magnetic alloy having the composition $Co_xM_yB_z$, M is at least one element selected from the group consisting of zirconium and hafnium, and x, y, z are respective atomic percents and $70 \leqq x \leqq 80$, $8 \leqq y \leqq 15$ and $10 \leqq z \leqq 16$.

4,440,586

METHOD OF MANUFACTURING A DIE FOR DUPLICATING PLASTICS INFORMATION CARRIERS

Gerardus J. M. Lippits; Arnoldus J. M. Van Den Broek; Adriaan J. G. Op Het Veld; Rinse Dijkstra, and Jelis De Jonge, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 95,130, Nov. 16, 1979, Pat. No. 4,275,091, which is a continuation of Ser. No. 887,188, Mar. 16, 1978, abandoned, which is a division of Ser. No. 774,973, Mar. 7, 1977, abandoned. This application Oct. 27, 1980, Ser. No. 200,666

Claims priority, application Netherlands, Oct. 15, 1976, 7611395

Int. Cl.³ C25D *5/56;* **B05D** *3/06*

U.S. Cl. 156—151 **3 Claims**

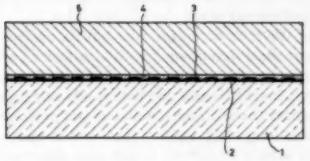
1. A method of manufacturing a die particularly adapted for the manufacture of a plastics information carrier containing an information track readable by an optical beam or similar reading means by:

(a) directly applying to a metal surface of a rigid, substantially flat die, which surface contains the negative of the desired information track, a thin layer of a thickness of 0.2–300 microns of a light-curable polymerizable liquid having a viscosity of from 1 to 100 cP and comprising low molecular weight acrylic monomers or a mixture of low molecular weight acrylic monomers and acrylic oligomers, which liquid contains 25–70% by weight of unsatu-

rated hydrocarbon and/or phenyl groups, has an average functionality in regard to unsaturatedness of between 2.1 and 6, is at least substantially aprotic and consists for at least 95% of monomers having a maximum average molecular weight of about 400;

(b) applying to the exposed surface of said thin layer of polymerizable liquid a thin light-pervious plastic substrate;

(c) exposing said thin layer of polymerizable liquid to light radiation through said substrate for a time sufficient to cause said thin layer of polymerizable liquid to cure to a solid state adhering to said substrate thereby producing a laminate of said substrate and said cured layer containing the desired optically readable information readily removable from said die without effect on said laminate or said die; and



(d) removing said laminate from said die,

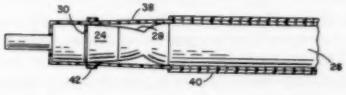
said method comprising providing on one major surface of a flat glass plate said information track, electrolessly depositing on said surface of said flat glass plate containing said information track a first metal layer by electroless deposition and then, depositing, by electrodeposition, a second metal layer on said first metal layer, causing a flat stiffening plate to adhere to the surface of said second metal layer remote from said first metal layer and removing said glass plate from the first metal layer thereby forming a flat father disc having a free metal surface containing the negative of said information track and suitable for use as a die.

4,440,587

METHOD OF MAKING ROCKET MOTOR CASE WITH INTEGRAL NOZZLE

Richard J. Thompson, and Ocke C. Fruchtnicht, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 2, 1982, Ser. No. 404,253
Int. Cl.³ B32B *31/00*; B65H *54/64*
U.S. Cl. 156—154 **4 Claims**



1. A method of making a rocket motor case with an integral nozzle comprising: providing a mandrel that has forward and aft sections with a necked down nozzle insert section mounted therebetween and said forward and aft sections and said nozzle insert having external configurations that define the desired internal configuration shape of a rocket motor case with an integral nozzle, said mandrel being mounted about a center line axis through said forward and aft mandrel sections and said nozzle insert, winding strands of reinforcing fibers about said mandrel at an angle of about 0 to about 15 degrees relative to said center line axis until said mandrel has the external surface completely covered with the winding strands radially spaced from an external portion of said necked down nozzle insert, radially wrapping fibers about the wound fiber on said aft section of said mandrel, radially wrapping fibers about the wound fibers at the forward end of said mandrel, cutting the linear fibers at the forward end of said mandrel beyond said radial wrapping thereon, squeezing the linear fibers between said two radial wrappings of fiber to cause said linear fibers to conform to the external shape of said nozzle insert, radially wrapping fibers about said nozzle insert from the smallest diameter thereof outwardly toward said other radially wrapped fibers to provide a rocket motor with an integral nozzle that has linear fibers for providing stiffness and radial fibers for providing burst strength.

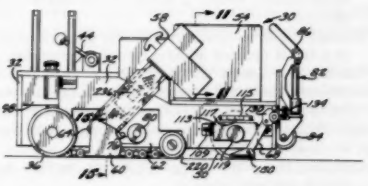
3. The method of making a rocket motor case and integral nozzle as defined in claim 1, wherein said fibers are preimpregnated with an epoxy resin before being wound into said rocket motor case and integral nozzle structure, and wherein said integrally wound rocket motor case and nozzle that has been wound on said mandrel are placed in an oven and cured.

4,440,588

HOT AIR WELDER FOR WELDING ROOFING MATERIAL

Edward J. Stevenson, 2727 Los Feliz, Thousand Oaks, and Donald E. Dean, 3065 Steven White Dr. #12, San Pedro, both of Calif. 90731

Filed Mar. 1, 1982, Ser. No. 353,168
Int. Cl.³ B32B *31/08*
U.S. Cl. 156—157 **28 Claims**



1. An improvement in a hot air roof welder for joining adjacent, overlapping layers of thermoplastic material comprising:

a chassis;

a heater assembly having a shaped delivery port arranged and configured for disposition between two overlapping layers of thermoplastic material, said shaped delivery port being coupled to the remaining portion of said heater assembly so that said shaped delivery port is reversible with respect to said chassis, said shaped delivery port having an inside and outside orientation with respect to said chassis; and

an air dam movably coupled to said chassis and disposed in relation to said shaped delivery port and chassis such that said air dam is disposed in a predetermined relationship with respect to said shaped delivery port, said air dam being disposed between said shaped delivery port and chassis when said shaped delivery port is arranged and configured in said inside orientation, said shaped delivery port being disposed between said air dam and said chassis when said shaped delivery port is arranged and configured in said outside orientation, said air dam forming in part in said thermoplastic material a barrier to confine hot air from said heater assembly to an area in proximity to said shaped delivery port and for downwardly urging said thermoplastic material thereby facilitating close contact between said shaped delivery port and said overlapping portions of said thermoplastic material,

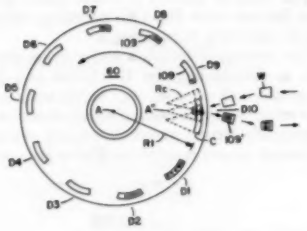
whereby a hot air welder is devised which is capable of manufacturing inside and outside welded seams with equal ease and facility.

4,440,589

PRINT TRANSFER DEVICE FOR DECORATING MACHINE

William E. Lock, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,722
Int. Cl.³ B32B 31/00; B29C 17/04; B65C 9/04; B41D 7/00
U.S. Cl. 156—232 11 Claims



1. A method of transferring a design from a planar design carrying surface to a conic design receiving surface having a central axis and apex therealong, transfer occurring by intimate non-slip rolling contact of the design carrying surface against the design receiving surface, comprising the steps of:

establishing the design in a plane representing a developed surface of the conic design receiving surface, said developed surface having a radius of curvature and a center therefor;

locating the developed surface in the design carrying surface at a radial position about a center of rotation;

rotating the design carrying surface about the center of rotation, the radial position of the design carrying surface being on a radius larger than its radius of curvature;

rotatably supporting the conic design receiving surface about its central axis;

engaging the conic design receiving surface against the design carrying surface;

establishing coincidence bwteeen the center of the developed surface and the apex of the conic design receiving surface;

orienting the conic design receiving surface into intimate rolling contact with the design carrying surface along a line of contact in the plane of the design, whereby the conic design receiving surface rollably engages the design carrying surface to effect the transfer of the design carried thereby on the conic design receiving surface, and including the step of moving the conic design receiving surface relative to the design carrying surface in response to the instantaneous position of the same such that the apex of the conic design receiving surface and the center of the design carrying surface are in coincidence in the line of contact;

maintaining intimate contact along said line of contact in the plane of the design; and

maintaining coincidence of the center of the developed surface and the apex of the conic design receiving surface during the step of engaging said surfaces together.

4,440,590

MANUFACTURE OF SIGNS

Ronald B. Collins; Martin E. Dowzall; Brian J. Smith, and Geoffrey R. Taylor, all of London, England, assignors to Letraset Corp.

Continuation of Ser. No. 903,770, May 8, 1978, abandoned. This application Feb. 24, 1982, Ser. No. 351,939
Claims priority, application United Kingdom, Oct. 4, 1977, 41245/77
Int. Cl.³ B32B 31/00; B41M 5/00; G09F 7/16
U.S. Cl. 156—234 18 Claims

1. In a method of manufacturing a sign comprising a sign sheet and wherein the indicia of the sign are provided on a preformed transfer material, the improvement which comprises:

providing a dry transfer material comprising a light transmitting carrier sheet bearing on one side a plurality of preformed discrete transferable thermoplastic adhesive ink film indicia,

transferring preselected ones of said ink film indicia completely from said carrier sheet to a temporary support sheet in the desired order to build up a predetermined legend for the sign, said transferring step being performed by applying pressure to the rear surface of the carrier sheet in the vicinity of said preselected indicia to create a bond between said preselected indicia and said temporary support sheet greater than the bond between said indicia and said carrier sheet,

bringing the transferred ink film indicia on the temporary support sheet into contact with a surface of a light transmitting sign sheet under sufficient heat and pressure to create a bond between said indicia and said sign sheet that is stronger than said bond between said preselected indicia and said temporary support sheet and to cause said transferred indicia to adhere to the sign sheet surface more strongly than to said temporary support, and

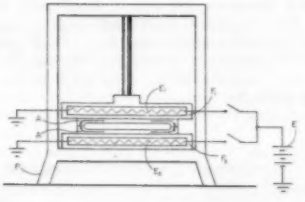
removing the temporary support sheet, from said ink film indicia to leave said indicia permanently bonded on the sign sheet, said indicia being readable through the sign sheet with no intervening adhesive and said sign sheet protecting said indicia against abrasion.

4,440,591

METHOD OF MANUFACTURING HIGH POTENTIAL ELECTRETS

H. Wilson Pook, 120 Widmore Rd., Bromley, Kent, England

Filed May 19, 1982, Ser. No. 379,648
Claims priority, application United Kingdom, May 20, 1981, 8115402
Int. Cl.³ B32B 31/20
U.S. Cl. 156—309.6 5 Claims



1. A method for producing electrets comprising the steps of:

placing a laminate assembly of dielectric plastic material, including a first and second exterior sheet of plastic material exteriorly placed on either side of a centrally disposed interior sheet of plastic material, between the opposed faces of a press;

closing and concurrently heating the faces of said press to produce compressive forces therebetween imposed on said laminate assembly and to heat the exterior sheets thereof to melting whereby said exterior sheets translate under pressure over said interior sheet to develop electrostatic charges in the course of said translation; and

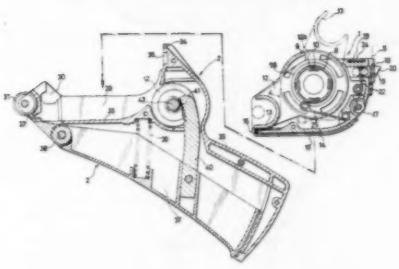
discontinuing the application of heat to said faces while maintaining said compressive forces therebetween until said laminate assembly cools, to thereby fix said electrostatic charges.

4,440,592

PORTABLE TYPE LABEL APPLYING APPARATUS

Yo Sato, Tokyo, and Tadao Kashiwaba, Kitagami, both of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Apr. 15, 1982, Ser. No. 368,732
Claims priority, application Japan, Apr. 30, 1981, 56-66223
Int. Cl.³ B65C 9/18, 9/46, 11/00
U.S. Cl. 156—384 43 Claims



23. A portable label applying apparatus, comprising:

a rolled label strip cassette for holding a composite label web, which web comprises a series of labels temporarily adhered to a web of backing paper; the cassette comprising a cassette frame; label rolling means on the frame for having the composite label web rolled up thereon; label delaminating means on the frame and spaced from the label rolling means for delaminating individual labels from the backing paper web; and guide means on the frame for guiding the backing paper web away from the delaminating means;

a label applier to which the cassette is removably attached; feed means in the label applier for engaging and feeding the backing paper web in a direction which delaminates the labels from the backing paper web at the delaminating means; and

a bail supported to the frame of the cassette and being movable between a first position away from the delaminating means and a second position closer to the delaminating means; a label strip holding portion on the bail for engaging the label strip in the second position of the bail for shifting the label strip to make a sharp turn around the delaminating means for aiding in delamination of labels from the backing paper web.

39. A portable label applying apparatus, comprising:

a rolled label strip cassette for holding a composite label web, which web comprises a series of labels temporarily adhered to a web of backing paper; the cassette comprising a cassette frame; label rolling means on the frame for having the composite label web rolled up thereon; label delaminating means on the frame and spaced from the label rolling means for delaminating individual labels from the backing paper web; and guide means on the frame for guiding the backing paper web away from the delaminating means; and

a label applier to which the casssette is removably attached; feed means in the label applier for engaging and feeding the backing paper web in a direction which delaminates the labels from the backing paper web at the delaminating means;

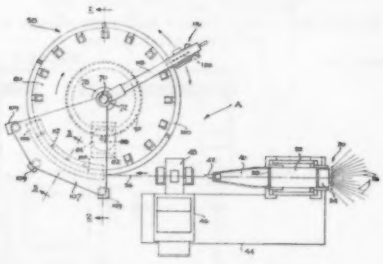
the label strip feed means comprises a feed roller rotatably attached to the label applier and an actuating lever on the label applier and connected with the feed roller for rotating the feed roller to engage and feed the backing paper web.

4,440,593

REINFORCED PLASTIC COMPOSITE ARTICLES AND APPARATUS AND METHOD FOR PRODUCING SAME

William B. Goldsworthy, Palos Verdes Estates, Calif., assignor to Goldsworthy Engineering, Inc., Torrance, Calif.

Filed Dec. 11, 1981, Ser. No. 329,757
Int. Cl.³ B32B 1/10, 31/26
U.S. Cl. 156—441 45 Claims



1. Apparatus for producing arcuately shaped filament containing reinforced plastic composite articles which have a non-constant cross-sectional shape over their length, said apparatus comprising:

(a) a first arcuately shaped die-forming member having an elongate recess which comprises a first recess portion of different cross-sectional shape than a second recess portion so as to be of non-constant cross-sectional shape over its length,

(b) a second arcuately shaped die-forming member located in proximity to and cooperating with said first die-forming member to form a filament containing reinforced plastic material receiving die channel comprised of said elongate recesses so that said die channel has a first channel portion of different cross-sectional shape than a second channel portion so as to be of non-constant cross-sectional shape over its length, and which second die channel portion is contiguous with said first die channel portion along the length of said die channel and in a direction of movement of one of said die-forming members so that the reinforced plastic material is simultaneously disposed in both of said die channel portions at a portion of the time during movement of at least one of the die-forming members, so that the reinforced plastic material is simultaneously disposed in both of said die channel portions at a portion of the time during movement of at least one of the die-forming members,

(c) means for moving at least one of said die-forming members and simultaneously pulling filament containing reinforcing material through said die channel with the moving die-forming member and at the same rate of speed as the moving die-forming member and for a substantial distance so that the two die-forming members form a die channel of substantial distance, and

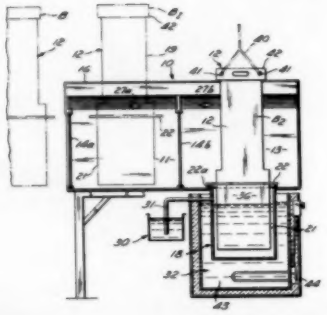
(d) curing means associated with at least one of said die-forming members for simultaneously applying a curing energy to the material in each of said die channel portions to thereby cure a binder impregnated in said filament containing reinforced plastic material while in said die channel and during movement thereof in said die channel, to thereby form a composite article which may have a first article portion of a first cross-sectional shape and a second article portion spaced from or contiguous with the first article portion along the length of the article and which second article portion has a different cross-sectional shape than the first article portion to thereby provide an article with a non-constant cross-sectional shape over its length.

4,440,594

METHOD AND APPARATUS OF CHEMICAL MILLING OF CHEMICAL MATERIALS

Llewelyn B. Stearns, 9213 E. Carron Dr., Pico Rivera, Calif. 90660

Filed Sep. 29, 1982, Ser. No. 427,734
Int. Cl.³ C23F 1/00
U.S. Cl. 156—664 20 Claims



20. The method for chemical milling of a workpiece which comprises:

(a) pre-treating said workpiece in a completely enclosed, substantially vapor tight, first zone, venting any gases produced during said pre-treatment;

(b) passing said pre-treated workpiece into an acid-milling solution contained in a substantially vapor tight second zone, without any introduction of air, during the transfer of said pre-treated workpiece to said second zone;

(c) reacting said pre-treated workpiece with said acid-milling solution, at a temperature above ambient temperature, to produce nitrogen oxide fumes in said second zone in the presence of minimal amounts of air during the reaction; and

(d) venting said fumes directly from said substantially air-tight second zone, into a third zone comprising a water containing vessel for the dissolution of water soluble nitrogen oxide gases.

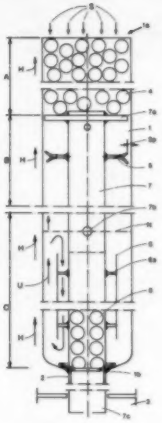
4,440,595

APPARATUS FOR CONCENTRATING MINERAL ACIDS

Hans Broberg, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Mar. 3, 1982, Ser. No. 354,403
Claims priority, application Sweden, Mar. 16, 1981, 8101648
Int. Cl.³ B01D 1/10, 1/14, 1/22
U.S. Cl. 159—13 A 19 Claims

1. Apparatus for the concentration of a mineral acid which comprises at least one externally heatable quartz tube having inlet means at the upper end thereof which is for the mineral acid to be concentrated, outlet means at the lower part thereof for draining off concentrated mineral acid; and outlet means at the upper part of the tube for removing rising vapors from the mineral acid; wherein said quartz tube includes an upper rectification zone, a center liquid film zone, and a lower reservoir zone; wherein said rectification zone includes means for providing a well moistened inner surface during use which is dependent upon the quantity of acid supplied, rate of rising vapors in said rectification zone, and vapors temperatures; said liquid film zone contains at least one device for causing turbulent flow of the vapors rising in the liquid film zone so that said vapors due to their turbulence and rate of ascent cause a coaction with the acid drops falling from said upper rectification zone whereby said acid drops disintegrate and are thrown against the inner surface of the quartz tube in the liquid film zone wherein they disintegrate further and mix with acid running down the inner surface of said quartz tube forming an essentially unbroken liquid film; and wherein said reservoir zone includes means for collecting acid running down from said liquid film zone and contains at least one circulatory device for controllably circulating collected acid during the boiling of collected acid and further contains overflow means for removing surplus concentrated acid.

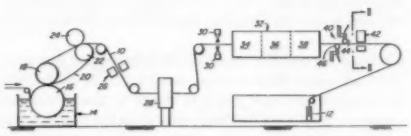


4,440,596

CONTROL OF DIAMETER OF FIBER INSULATION ON CONDUCTORS

Michael A. Shannon, Glenburnie, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 21, 1982, Ser. No. 380,612
Int. Cl.³ E04C 1/62
U.S. Cl. 162—106 7 Claims



1. A pulp vat apparatus for applying a layer of pulp fiber to conductors comprising a vat, a cylinder mould rotatable within the vat about an axis to move any part of its periphery alternately towards and away from the bottom of the vat, the mould having axially spaced annular perforate regions each for accommodating a conductor as the conductors pass in laterally spaced positions downwardly into the vat beneath the mould and upwardly out of the vat, an outlet for water from within the mould, partition means within the vat extending radially outwards from the cylinder mould in positions between perforate regions to divide the vat into compartments with each perforate region associated solely with one compartment, flow inlet means for pulp to each compartment, means to vary the rate of flow of pulp through each inlet means independently of the other inlet means, means for guiding a plurality of electrical conductors through the vat in laterally spaced positins along the annular perforate regions of the mould, means for measuring the diameter of the fiber insulation surrounding each of the conductors after drying of the fiber and for producing a signal corresponding to the measured diameter, and means to operate the flow rate varying means depending upon the variation of the produced signal from a datum signal representative of a desired diameter, to raise or lower the level of the pulp in each compartment independently of other compartments and corre-

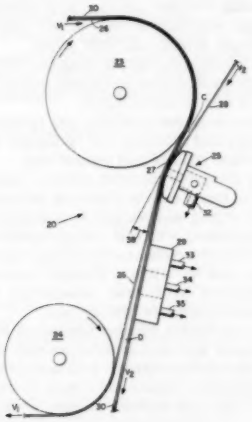
sponding to a required increase or decrease in the diameter of the fiber towards the desired diameter.

4,440,597

WET-MICROCONTRACTED PAPER AND CONCOMITANT PROCESS

Edward R. Wells, Cincinnati, and Thomas A. Hensler, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 15, 1982, Ser. No. 358,500
Int. Cl.³ D21H *5/24*
U.S. Cl. 162—111 **27 Claims**



1. A process for making high bulk, MD-extensible tissue paper having a predetermined MD stress/strain modulus substantially different from comparably extensible dry-creped paper, said MD stress/strain modules being substantially greater than for said comparably extensible dry-creped paper through their lowest one-third ranges of MD extensibility, said process comprising the steps of:

forming an embryonic paper web from an aqueous fibrous papermaking furnish;

forwarding said embryonic web at a first velocity on an endless carrier fabric to a transfer zone;

non-compressively removing sufficient water from said embryonic web that it has a fiber consisting of from about ten (10) to about thirty (30) percent immediately prior to its reaching said transfer zone to enable said embryonic web to be transferred to an endless foraminous transfer fabric at said transfer zone, said transfer fabric having a sufficiently greater void volume than said carrier fabric to obviate macrofolding of said web;

forwarding at a second velocity said endless foraminous transfer fabric along a looped path in contacting relation with a transfer head disposed at said transfer zone, said transfer head having a convex fabric-contacting surface, said second velocity being substantially less than said first velocity;

guiding said carrier fabric and said transfer fabric to cause them to converge and then diverge at acute angles while traversing said convex surface, said acute angles being sufficiently small and the curvature of said convex surface being sufficiently large to substantially obviate fabric-tension-induced compaction of said embryonic web as it passes through said transfer zone;

applying only a sufficient level of differential gaseous pressure across said embryonic web at said transfer zone to cause said embryonic web to transfer to said transfer fabric in said transfer zone without precipitating substantial compaction of said embryonic web; and

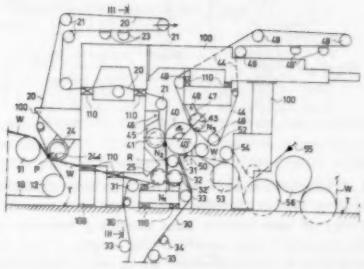
completing the papermaking-machine drying of said embryonic web while maintaining the macroscopic interfiber relationships therein in the plane of the web and without overall mechanical compaction of the web.

4,440,598

PRESS SECTION IN A PAPER MACHINE

Erkki Koski, and Olli Tapio, both of Jyväskylä, Finland, assignors to Valmet Oy, Finland

Filed Jul. 27, 1981, Ser. No. 287,299
Claims priority, application Finland, May 7, 1981, 811403
Int. Cl.³ D21F *3/04, 3/08*
U.S. Cl. 162—305 **18 Claims**



1. A no-draw press section of a paper machine comprising:

a first double felted press nip defined by first and second rolls through which first upper and second lower felt fabrics pass, a paper web leaving the wire section of the paper machine being supported by the first felt fabric and conducted through the first double felted press nip between said two felt fabrics so that the web is dewatered through both of its surfaces in said first double felted press nip;

at least two single felted press nips defined against a plain surface roll, said first felt fabric passing through a first one of said single felted press nips to serve as a press fabric therein, said first single felted press nip being situated at a given distance from said first double felted press nip, the first felt fabric and paper web supported thereby having a run between the first double felted press nip and the first single felted press nip whereupon the web separates from said first felt fabric after passing through said first single felted press nip and adheres to the surface of said plain surface roll and is conducted on said surface to a second one of said single felted press nips through which a separate third press felt passes;

said press section including only non-suction rolls and wherein said first and second rolls each have a solid shell and a recessed surface;

said first upper felt fabric which constitutes a fabric loop and the web supported thereby being guided over a first sector of said first recessed surface roll which is prior to said first double felted press nip and located inside said first felt fabric loop such that the direction of the run of said first felt fabric which wraps said first sector of said first recessed surface roll and the web supported thereby is changed so as to be directed generally upwardly prior to said first double felted press nip, the magnitude of said first sector being in the range of about 30° to 150°; and

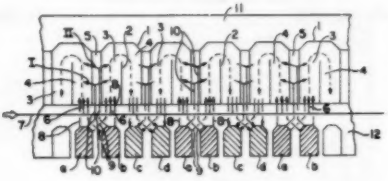
said second lower felt fabric which passes through said first double felted press nip being guided over a second sector of said first recessed surface roll which is substantially as large as or only slightly smaller than said first sector of said first recessed surface roll to provide external support for the web prior to said first double felted press nip, said second felt fabric being separated from the web substantially immediately after said first double felted press nip.

4,440,599

HEATING SYSTEM FOR A COKE OVEN BATTERY HAVING TWIN-HEATING FLUES

Carl-Heinz Struck, Bochum; Ralf Schumacher, Hagen, and Heinz Thubeauville, Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 447,198
Int. Cl.³ C10B *21/06, 21/18, 21/22*
U.S. Cl. 202—141 6 Claims



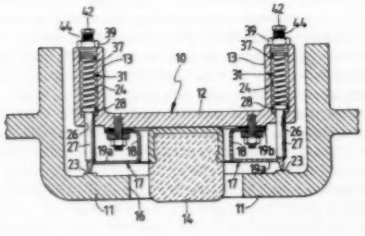
1. A battery of coke ovens with coke oven chambers having a heating system therefor, said heating system including a plurality of twin-heating flues extending between said coke oven chambers transversely to the length of said battery of coke ovens, a flue midfeather for dividing each twin-heating flue into two flue parts interconnected by a flow space across the top of said flue midfeather, an oven crown, an oven sole, a heating wall midfeather extending from said oven sole to said oven crown between each of said twin-heating flues, and regenerators extending below said oven sole transversely of said battery of coke ovens, three passageways extending from each regenerator in a manner such that two regenerators communicate with each twin-heating flue, said three passageways comprising a first passageway extending into the bottom of a first flue part of a first twin-heating flue, a second passageway extending into the bottom of a first flue part of an adjacent twin-heating flue which is separated by one of said heating wall midfeathers from said first twin-heating flue, and a third passageway rising in the last-mentioned heating wall midfeather and having a branched passageway communicating with each of said first flue parts.

4,440,600

SPRING ADJUSTING DEVICE FOR A SELF-SEALING COKE OVEN DOOR

Samuel J. Cantavespre, Birmingham, Ala., assignor to Haran W. Bullard, Jr., Birmingham, Ala., a part interest

Filed Sep. 30, 1982, Ser. No. 429,824
Int. Cl.³ C10B *25/06, 25/16*
U.S. Cl. 202—248 6 Claims



1. In a self-sealing coke oven door carrying a flexible sealing member at the side thereof facing an opening for a coke oven door and including a continuous sealing edge in position to engage an adjacent sealing surface on a coke oven door jamb in response to placement of the door within its coke oven door opening, the improvement comprising:

(a) there being a plurality of spaced apart plunger receiving openings extending through and disposed around the coke oven door adjacent the outer edge thereof,

(b) there being a plurality of elongated, outwardly projecting housings carried by the side of said door opposite the side thereof carrying said sealing member with each said housing having a passageway therethrough in alignment with an adjacent plunger receiving opening,

(c) an elongated plunger mounted for sliding movement through each said plunger receiving opening with the innermost end of said plunger in position to engage said sealing member and urge said sealing edge into engagement with said sealing surface upon movement of said plunger toward said door jamb,

(d) a compression spring mounted within said passageway with the innermost end of said spring contacting the outermost end of said plunger,

(e) alignment means within said passageway engaging said spring and retaining said spring out of engagement with the side walls of said passageway,

(f) an elongated threaded actuator member carried by the outer end of each said housing for compressing said spring and urging said plunger toward said door jamb and into engagement with said sealing member,

(g) a closure member enclosing the outer end of said passageway and including a threaded opening therethrough in alignment with said passageway for receiving said threaded actuator member, and

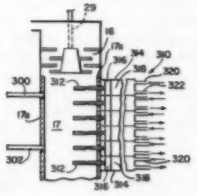
(h) an extensible member interposed between said closure member and said actuator member and defining a labyrinth seal therebetween with said extensible member being adapted to contract and expand in response to rotation of said threaded actuator member in opposite directions.

4,440,601

METHOD AND APPARATUS FOR HIGH VOLUME FRACTIONAL DISTILLATION OF LIQUIDS

Jerome Katz, and Sidney J. Fogel, both of Rochester, County of Monroe, N.Y.

Continuation-in-part of Ser. No. 115,615, Jan. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 769,291, Feb. 22, 1977, Pat. No. 4,186,060, and a continuation-in-part of Ser. No. 787,832, Apr. 18, 1977, Pat. No. 4,186,058. This application Jan. 15, 1981, Ser. No. 224,072
Int. Cl.³ B01D *1/28, 3/14;* B01J *8/02*
U.S. Cl. 203—24 86 Claims



1. A method for high volume distillation of impure liquids comprising the steps of:

(a) evaporating said impure liquid in a fractional distillation evaporator to separate a low boiling component vapor from said liquid;

(b) compressing said vapor to a predetermined pressure;

(c) reacting at least a portion of said compressed vapor at said predetermined pressure in the vapor phase in a catalyst-containing reaction zone for producing an adjusted composition vapor;

(d) compressing said vapor exiting said reaction zone to form a recompressed vapor at a predetermined pressure corre-

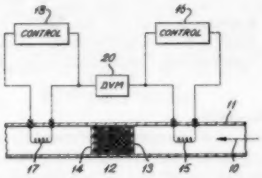
sponding to a predetermined temperature differential between said recompressed vapor and said impure liquid;
(e) adding sufficient energy to operate said compression steps;
(f) cooling said recompressed vapor in heat transfer relation with said impure liquid whereby said recompressed vapor at least partially condenses, transferring heat to said impure liquid for fractionally distilling said liquid and separating said low boiling component vapor; and
(g) collecting said condensed low boiling component.

4,440,602

APPARATUS AND METHOD FOR MEASURING THE CONCENTRATION OF IONS

John V. Dobson, Hartlepool, England, assignor to National Research Development Corporation, London, England

Filed May 4, 1982, Ser. No. 374,895
Claims priority, application United Kingdom, May 6, 1981, 8113820
Int. Cl.³ G01N 27/46
U.S. Cl. 204—1 T 7 Claims



1. A method of measuring the concentration of a predetermined ion in an electrolyte, comprising the steps of
passing an electrolyte along a duct, the electrolyte containing first ions, the concentration of which is to be measured, and second ions,
measuring an electromotive force which depends on the concentration of the second ions (but not the first ions) at a first location in the duct,
passing the electrolyte through material positioned in the duct downstream of the first location, the material, when equilibrated with the electrolyte, changing the concentration of the second ion in accordance with the concentration of the first ion,
and
measuring, at a second location downstream from the said material, an electromotive force which depends on the concentration of the second ion (but not the first ion),
the flow rate of the electrolyte along the duct being constant when a quasi electronic equilibrium is set up or sufficiently slow to allow ionic equilibrium to be set up in the regions of the first and second locations.

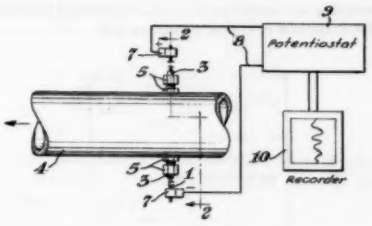
4,440,603

APPARATUS AND METHOD FOR MEASURING DISSOLVED HALOGENS

Richard M. VanEffen; James D. McLean, and Dalton L. Decker, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 17, 1982, Ser. No. 389,360
Int. Cl.³ G01N 27/46
U.S. Cl. 204—1 T 14 Claims

8. Amperometric method for measuring dissolved halogen gases and chemical analogs thereof in a stirred or flowing electrolyte solution, and which comprises contacting the solution to be measured with a cathode electrode and at least a second electrode which is a reference electrode, the cathode electrode comprising a substrate on which is formed an adherent electrically conductive film, and which forms the working surface of the cathode electrode, the film being of a composition which comprises $[Ti_x(Ru, Ir)_{1-x}]O_2$, wherein x=mole fraction ≥ 0 to <1, and (Ru, Ir) represents either ruthenium or iridium or mixtures thereof, impressing a negative D.C. voltage on the cathode electrode whereby the cathode electrode has a negative polarity of between about -0.1 to -1 volt, and



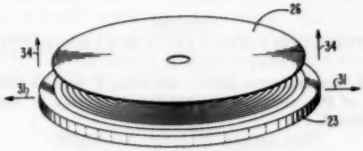
which avoids substantial reductions of electroactive materials in the solution other than said halogen analytes of interest, and measuring the current flowing as a result of the applied voltage to measure responding halogen analyte(s) of the solution.

4,440,604

METHOD FOR THE MANUFACTURE OF LAPPING DISC FOR FORMING KEELS ON VIDEODISC STYLI

Charles H. F. Morris, Jr., Allentown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 25, 1982, Ser. No. 436,378
Int. Cl.³ C25D 1/10
U.S. Cl. 204—5 9 Claims



1. In the matrixing method employed in the manufacture of a lapping disc for forming a keel of a predetermined cross sectional configuration on a terminal end of a videodisc stylus wherein a flat surface of a metal substrate is recorded with a spiral groove having an aspect ratio of about one or less, almost perpendicular walls and a configuration substantially mating the predetermined cross sectional configuration of the keel and a metal master is thereafter electroformed on the surface of the substrate to provide an assembly of a predetermined diameter of the master formed on the substrate, the improvement which comprises: causing the separation of the master from the substrate by substantially uniformly heating the assembly to a temperature sufficient to cause separation of the master from the substrate.

4,440,605

REPAIR OF REINFORCED CONCRETE STRUCTURES BY MINERAL ACCRETION

Wolf H. Hilbertz, Austin, Tex., assignor to The Marine Resources Company, Galveston, Tex.

Filed Feb. 13, 1981, Ser. No. 234,321
Int. Cl.³ C25B 1/00; C25D 9/08
U.S. Cl. 204—16 5 Claims

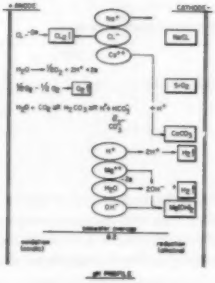
1. A method of repairing a damaged concrete structure comprising a concrete body and a metal reinforcing member embedded therein, said structure being in a damaged condition

by reason of a separation in the concrete body, comprising the steps of:

disposing the damaged concrete structure in a volume of electrolyte;

disposing an anode in the electrolyte in proximity to the concrete structure;

connecting said anode to the positive potential terminal of a direct current electrical power supply;



connecting the metal reinforcing member in said concrete structure to the negative potential terminal of said direct current electrical power supply, making said member a cathode; and

establishing a direct electrical current between the cathode and the anode for a time sufficient for accreting a solid mass of high strength electro-deposited mineral material within the separation in the concrete body to fill the same and bind opposing sides of the separation together.

4,440,606

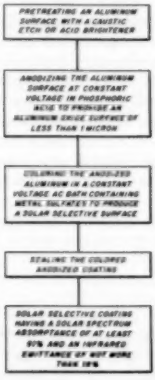
METHOD FOR PRODUCING A SOLAR SELECTIVE COATING ON ALUMINUM

John H. Powers, Lower Burrell, and Hang T. Dang, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 18, 1982, Ser. No. 409,067

Int. Cl.³ C25D *11/22*

U.S. Cl. 204—33 **22 Claims**


PRETREATING AN ALUMINUM SURFACE WITH A CAUSTIC ETCH OR ACID BRIGHTENER
ANODIZING THE ALUMINUM SURFACE AT CONSTANT VOLTAGE IN PHOSPHORIC ACID TO PROVIDE AN ALUMINUM OXIDE SURFACE OF LESS THAN 1 MICRON
COLORING THE ANODIZED ALUMINUM IN A CONSTANT VOLTAGE AC BATH CONTAINING METAL SULFATES TO PRODUCE A SOLAR SELECTIVE SURFACE
SEALING THE COLORED ANODIZED COATING
SOLAR SELECTIVE COATING HAVING A SOLAR SPECTRUM ABSORPTANCE OF AT LEAST 90% AND AN INFRARED EMITTANCE OF NOT MORE THAN 18%

1. A process for the production of a solar selective coating on aluminum which comprises:

(a) pretreating the aluminum surface;

(b) anodizing the pretreated aluminum at a constant voltage of at least 10 volts in a phosphoric acid bath for a time period sufficient to provide a total anodizing current of from 90 to 175 coulombs per square decimeter of aluminum surface;

(c) coloring the anodized aluminum using alternating current in a coloring bath containing at least 85 grams per liter of metal sulfates at a constant voltage of from 8 to 12 volt RMS for a time sufficient to permit total current flow of from 100 to 325 coulombs per square decimeter; and

(d) sealing the colored anodized coating to provide a solar selective coating on aluminum of less than 1 micron thickness and having an infrared emittance of not more than 18% and a solar spectrum absorptance of at least 91%.

4,440,607

METHOD OF PRODUCING TIN PLATE FOR LITHOGRAPHY WITH DIRECT PRINTED ULTRAVIOLET-CURED INKS

Salvatore B. Messineo, Upland; Don L. Lasswell, Montclair, and Joe Yee, Upland, all of Calif., assignors to Kaiser Steel Corporation, Oakland, Calif.

Continuation of Ser. No. 228,246, Jan. 26, 1981, abandoned, which is a continuation of Ser. No. 79,836, Sep. 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,794, Dec. 12, 1978, abandoned. This application Jun. 1, 1982, Ser. No. 383,628

Int. Cl.³ C25D *11/38*

U.S. Cl. 204—35 N **6 Claims**

1. The method of treatment of reflowed tin plate to provide the plate with surface properties enabling the adhesion thereto of ultraviolet light cured, low solvent printing inks comprising immersing tin plate in an aqueous solution of sodium dichromate, rinsing and drying the tin plate, and oiling the surface thereof with acetyl tributyl citrate, the improvement which comprises maintaining said solution of sodium dichromate at a concentration within the range of from about 15 grams per liter to about 30 grams per liter and at a pH of from about 2.0 to about 3.0, and applying ultraviolet light curable, low solvent ink to the oiled tinplate.

4,440,608

PROCESS AND BATH FOR THE ELECTRODEPOSITION OF TIN-LEAD ALLOYS

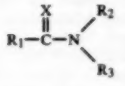
Vincent C. Opaskar, Cleveland Heights; Sidney C. Beach, Parma, and Robert J. Zellner, Shaker Heights, all of Ohio, assignors to McGean-Rohco, Inc., Cleveland, Ohio

Filed Aug. 16, 1982, Ser. No. 408,238

Int. Cl.³ C25D *3/56, 3/60*

U.S. Cl. 204—43 S **12 Claims**

7. A bath for the electrodeposition of alloys of tin and lead comprising an aqueous acidic fluoride containing lead-tin plating solution having dissolved therein from about 0.025 to about 5.0 g/l of at least one compound having the formula



wherein X is O, S, or NH and R_2 and R_3 are H, or lower alkyl and R_1 is

4,440,609

METHOD OF ELECTRODEPOSITING A LOW COERCINE FORCE, CORROSION-RESISTANT ALLOY OF NICKEL, IRON AND BORON

Marybelle C. Blakeslee, Golden, Colo.; Judith D. Olsen, Golden's Bridge, and Lubomyr T. Romankiw, Briarcliff Manor, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 221,598, Dec. 31, 1980, abandoned. This application May 11, 1983, Ser. No. 493,499
Int. Cl.³ C25D *3/56*
U.S. Cl. 204—43 T 3 Claims

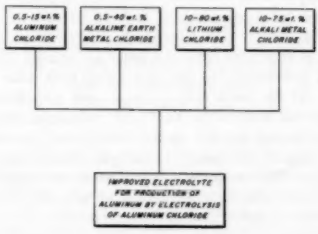
1. A process for electrodepositing an alloy of high corrosion resistance and H_o and H_c of less than 0.1 Oe in films 3000 Å thick, said process comprising electrodepositing nickel-iron and boron from an acid bath of pH at or below 2.5 which comprises a borane reducing agent, with the deposited alloy containing approximately 0.1 to 2% by weight boron, from 17% to 27% by weight iron, and the balance nickel.

4,440,610

MOLTEN SALT BATH FOR ELECTROLYTIC PRODUCTION OF ALUMINUM

Robert K. Dawless, Monroeville; Alfred F. LaCamera, Level Green, and Chester H. Klingensmith, Leechburg, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 27, 1982, Ser. No. 423,682
Int. Cl.³ C25C *3/06*
U.S. Cl. 204—67 10 Claims


0.5-15 wt.% ALUMINUM CHLORIDE
0.5-40 wt.% ALKALINE EARTH METAL CHLORIDE
10-80 wt.% LITHIUM CHLORIDE
10-75 wt.% ALKALI METAL CHLORIDE
IMPROVED ELECTROLYTE FOR PRODUCTION OF ALUMINUM BY ELECTROLYSIS OF ALUMINUM CHLORIDE

1. In an improved process for electrolytic production of aluminum by electrolysis of aluminum chloride in a cell, the electrolysis being performed in a metal chloride electrolyte bath characterized by a lower aluminum solubility, the improvement comprising performing the electrolysis in an electrolyte consisting essentially of 0.5 to 15 wt.% aluminum chloride, from 3 to 40 wt.% of an alkaline earth metal chloride selected from the group consisting of barium, calcium, magnesium and strontium chloride, from 10 to 90 wt.% lithium chloride, and from 10 to 80 wt.% sodium chloride.

4,440,611

CATHODIC ELECTROCHEMICAL PROCESS FOR PREVENTING OR RETARDING MICROBIAL AND CALCAREOUS FOULING

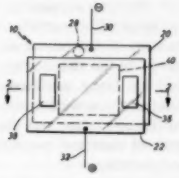
Hari P. Dhar; John O. Bockris, and Donald H. Lewis, all of College Station, Tex., assignors to The Texas A & M University System, College Station, Tex.

Filed Dec. 9, 1981, Ser. No. 328,853
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—147 8 Claims

1. A method of preventing or retarding microbial or calcareous fouling of a conducting or semi-conducting surface in an aqueous environment, comprising:

applying a cathodic voltage and a cathodic current to said surface for the electrochemical production of hydrogen peroxide from oxygen dissolved in said aqueous environment;

limiting the maximum voltage and the maximum current applied to said surface to produce substantially no hydrogen by the electrolysis of said aqueous environment; and



controlling said cathodic voltage within a range of potentials for continuously producing hydrogen peroxide on said suerface.

4,440,612

RESINOUS COMPOSITIONS CURABLE THROUGH A TRANSESTERIFICATION CURING MECHANISM

Joseph T. Valko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 288,238, Jul. 29, 1981. This application May 11, 1983, Ser. No. 493,467
Int. Cl.³ C25D *13/06*; C08L *63/02*
U.S. Cl. 204—181 C 4 Claims

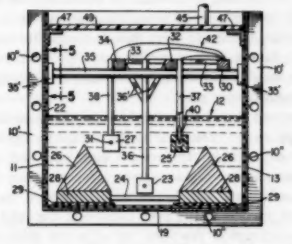
1. In a method of coating a conductive substrate serving as a cathode in an electrical circuit comprising said cathode and an anode immersed in an aqueous electrodepositable coating composition, said method comprising passing electric current between said cathode and said anode to cause a coating to deposit on said cathode; said coating composition comprising a polymeric polyol containing cationic groups, a polyester crosslinking agent and a transesterification catalyst, characterized in that the polyester crosslinking agent has at least two beta-alkoxyester groups per molecule and the coating composition is substantially free of polyesters containing more than one beta-hydroxyester group per molecule.

4,440,613

ELECTROPLATING MACHINE

Chester Pilgrim, 320 A Summit St., West Reading, Pa. 19611

Filed May 3, 1982, Ser. No. 374,004
Int. Cl.³ C25D *17/02*; B65G *49/04*
U.S. Cl. 204—206 18 Claims



1. A wire electroplating machine comprising:

a continuous electrolyte bath contained in a tank with a bottom, two side walls and two end walls;

means for moving the wire through said continuous electrolyte bath and positioned to receive the wire after it has passed through said bath;

a first electrode means located in said bath so as to create a first charging area and providing metallic ions having an electrical charge of one polarity, said first electrode means including (a) at least one longitudinal metallic conductor,

said longitudinal conductor having upwardly raised contact areas at spaced apart locations along the top surface thereof, (b) means for insulating the longitudinal conductor from the tank containing the electrolyte bath, (c) at least one longitudinal metallic ion producing metal bar having recesses at spaced locations along its bottom which correspond to the raised areas of said longitudinal conductor, said bar being mounted on said longitudinal conductor such that there is electrical contact between the raised areas of the conductor and the recesses of the bar, and (d) a source of electrical potential connected to said longitudinal conductor;

at least one insulating housing located in and surrounded by said bath, said housing being positioned such that the wire passes through the housing without substantial deviation from a straight path and without permitting a substantial number of metallic ions to enter the housing from the continuous electrolyte bath; and

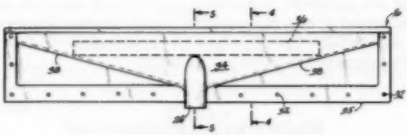
a second electrode means located at least partially in said insulating housing for imparting an electrical charge to the wire of opposite polarity to that of the metallic ions, said second electrode means creating a second charging area in said insulating housing that is isolated from the first charging area resulting from said first electrode means.

4,440,614

INLET END BOX BRINE PIPE BAFFLE

Don E. Reynolds, and James F. Pickering, both of Athens, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 10, 1983, Ser. No. 550,438
Int. Cl.³ C25B *1/40, 9/00, 15/08*
U.S. Cl. 204—219 **6 Claims**



1. In a flowing mercury cathode electrolytic cell for the electrolysis of aqueous solutions to produce at least one product gas and a product hydroxide having a cell box with a cathodic conducting insulated side walls, and an insulated and removable top, brine inlet trough means having a first side and an outer side, the brine inlet trough means further having an inlet flow funnel and opposing ends, product outlet means, adjustable anodes and electrical current conducting means, the improvement comprising:

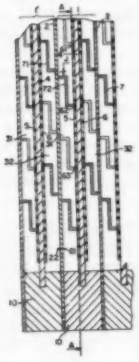
an improved flow baffle means insertable into the brine inlet trough means, the flow baffle means being elongate and generally tubular between a first end and an opposing second end having an upper circumference and a lower circumference, the lower circumference having a fully closed portion in the area overlying the inlet flow funnel and interrupted portions on adjacent sides of the fully closed portion with at least one opening on each side extending outwardly to the first and second opposing ends, the upper circumference being fully closed for a portion in an area intermediate the first end and the opposing second end and being interrupted on adjacent sides of the fully closed portion with at least one opening on each side intermediate the fully closed portion of the upper circumference and the first end and the second opposing end, respectively, the upper circumference further being fully closed adjacent the first end and the opposing second end.

4,440,615

FILTER-PRESS TYPE ELECTROLYZER

Gerard Pere, Le Breuil, France, assignor to Creusot-Loire, Paris, France

Filed Jul. 30, 1982, Ser. No. 403,684
Claims priority, application France, Sep. 30, 1981, 81 18421
Int. Cl.³ C25B *9/00;* **C25C** *7/00;* **C25D** *17/00*
U.S. Cl. 204—253 **4 Claims**



1. A filter-press type electrolyzer housing a plurality of cells and equipped with electrodes consisting of solid metal plates (2), called "plate electrodes", and of latticed or perforated plates (5,6), called "pre-electrodes", parallel to said plate electrodes and separated from the latter by bracing tongues (71, 72), said pre-electrodes disposed along both sides of a diaphragm (4) for each cell, wherein said pre-electrodes are equipped with solid strips (61, 62, 63), which are all parallel to one another and parallel to the direction (F) in which said bracing tongues are welded to said pre-electrodes, each bracing tongue (72) having the shape of an S and being welded to the associated pre-electrode on a solid strip (62) of the latter, and to the associated plate electrode, so as to leave a gap (J) from the associated tongue (71), located on the opposite face of said plate electrode, and said bracing tongues being placed in staggered arrangement, as viewed in a plane prallel to said electrodes.

4,440,616

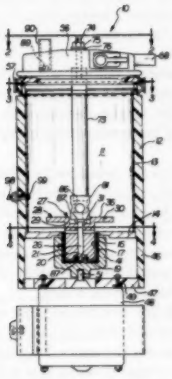
METAL COLLECTOR

Kenneth R. Houseman, Westlake, Ohio, assignor to General Dental Inc., St. Louis, Mo.

Filed Sep. 30, 1982, Ser. No. 431,026
Int. Cl.³ C25C *7/00;* **C25B** *11/12*
U.S. Cl. 204—272 **7 Claims**

1. A device for collecting ionized metal from a liquid solution comprising a generally cylindrical chamber, means forming a cathode for receiving metal deposits adjacent the circumference of the chamber, an anode in the chamber adjacent its axis, a liquid inlet and means associated with the inlet for supplying liquid to a zone adjacent the axis of the chamber and adjacent one end thereof, outlet means adjacent an opposite end of the chamber for conducting liquid from the chamber, an impeller/turbulator supported in the chamber between said inlet means and said chamber one end for rotation about the axis of said chamber, means to rotate said impeller/turbulator about the chamber axis, the impeller/turbulator having a rotor including flow inducing channel means having an axial component in its orientation, said impeller/turbulator being adapted to induce a turbulent helical pattern of flow of liquid through the chamber, said channel means having said axial component having a closed boundary, said impeller/turbulator including a

disc concentrically disposed on the axis of the chamber, said channel means having an inlet on a side of the disc facing said



one chamber end and an outlet on a side of the disc facing said opposite chamber end.

4,440,617

NON-BLEEDING ELECTRODE

Frank Solomon, Great Neck, N.Y., assignor to Diamond Shamrock Corporation, Dallas, Tex.

Division of Ser. No. 202,564, Oct. 31, 1980, Pat. No. 4,370,284. This application Oct. 27, 1982, Ser. No. 436,979

The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.

Int. Cl.³ C25B *11/06*

U.S. Cl. 204—290 R **11 Claims**

1. A non-bleeding gas electrode consisting essentially of a hydrophobic, polytetrafluoroethylene-containing, porous backing layer, an active layer containing high surface area carbon particles and a current distributor, wherein said active layer has pores ranging in size from about 1 to about 40 microns and sufficiently large to relieve internal liquid pressures in said active layer.

4,440,618

GAS DISCHARGE DEVICE COMPRISING A PRESSURE CONTROLLER FOR CONTROLLING A PRESSURE OVER A WIDE RANGE

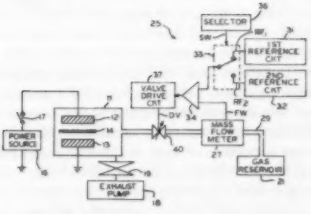
Toshiyuki Suzuki, and Kazuo Nakamura, both of Tokyo, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,862

Claims priority, application Japan, Mar. 19, 1982, 57-42818

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **7 Claims**



1. A gas discharge device including a chamber defining a hollow space, a first electrode in said hollow space, a second electrode opposite to said first electrode in said hollow space, voltage supplying means for supplying a voltage between said first and said second electrodes, exhausting means for exhausting said hollow space, and gas introducing means for introducing a gas into said hollow space, said voltage causing a gas discharge to start at a first pressure and to continue at a second pressure which is lower than said first pressure, in said hollow space between said first and said second electrodes, said gas discharge comprising pressure adjusting means coupled to at least one of said exhausting means and said gas introducing means for adjusting said pressure between said first and said second pressures at a first and a second flow rate which are variable within a first and a second predetermined range, respectively, said first predetermined range being higher than said second predetermined range by a preselected order.

4,440,619

ELECTRO-ANALYTICAL MEASURING EQUIPMENT WITH MEASURING CELL, COMPRISING INTEGRAL SENSING ELEMENT AND SEVERAL REFERENCE ELECTRODES

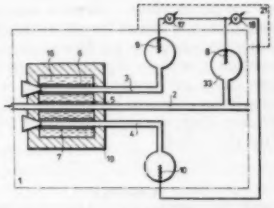
Janos Daroczy; Janos Erdelyi; Jeno Havas; Lajos Kecskes; Henrik Müller; Katalin Nyiro, and Ferenc Takacs, all of Budapest, Hungary, assignors to Radelkis Elektrokemiai Müszergyarto Szövetkezet, Budapest, Hungary

Filed Mar. 1, 1982, Ser. No. 353,289

Claims priority, application Hungary, Mar. 13, 1981, 639/81

Int. Cl.³ G01N *27/28*

U.S. Cl. 204—401 **5 Claims**



1. In electro-analytical measuring equipment having at least one measuring cell and an electronic signal processor for selective and rapid determination of the concentration and ion-activity of a stationary or flowing sample solution or of the partial pressure of a sample, the improvement wherein the measuring cell comprises an integral sensor having three sensing elements of chemically similar composition and in constant electrically conductive contact with each other, one of the sensing elements in contact with a sample and the other sensing elements in contact with two different standardizing media and three reference electrodes connected to the electronic signal processor, with one of the reference electrodes in contact with the sample through an internal electrolyte and the other reference electrodes in contact with the standardizing media through two other internal electrolytes.

4,440,620

MEASURING ELECTRODE DEVICE

Noriaki Ono, and Takashi Kamiyama, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1982, Ser. No. 449,700

Claims priority, application Japan, Dec. 22, 1981, 56-206100; Dec. 22, 1981, 56-206101; Dec. 22, 1981, 56-206103

Int. Cl.³ G01N *27/30, 27/46*

U.S. Cl. 204—403 **20 Claims**

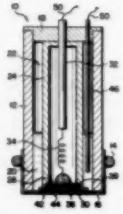
1. A measuring electrode device for measuring the concentration of a predetermined gas or a biochemical substance dissolved in a liquid to be inspected, comprising:

an outer casing of substantially cylindrical shape having an open one end;

a gas permeable membrane attached to the one end of the outer casing to close the one end and to permeate only gas dissolved in the liquid to be inspected toward the outer casing when contacted with the liquid to be inspected;

an electrolyte housed in the outer casing and in contact with the gas permeable membrane and which varies in the pH upon reaction with the predetermined gas permeated through the gas permeable membrane;

a reference electrode arranged in the outer casing, partly dipped in the electrolyte and maintained at a predetermined potential;



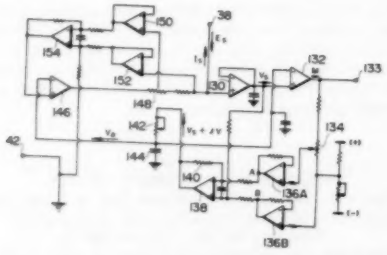
a pH electrode arranged within the outer casing and having a pH sensitive member in contact with the electrolyte, the member having a semiconductor substrate and a pH sensitive membrane formed on the substrate and in contact with the electrolyte, a potential difference being produced between the pH sensitive membrane and the electrolyte according to a variation of the pH of the electrolyte, the pH sensitive membrane being formed of at least one element selected from the group consisting of silicon nitride, aluminum oxide and tantalum pentoxide, and a potential difference being produced between the pH electrode and the reference electrode according to the variation of the pH of the electrolyte.

4,440,621

SYSTEM FOR DETECTION OF AIR/FUEL RATIO IN IC ENGINE BY USING OXYGEN SENSOR OPERATED WITH SUPPLY OF CURRENT

Tsuyoshi Kitahara, Yokohama; Masaaki Uchida, Yokosuka, and Kohki Sone, Tokyo, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Dec. 2, 1982, Ser. No. 446,315
Claims priority, application Japan,
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—406 **9 Claims**



1. In a system for detecting the air/fuel ratio of air-fuel mixture supplied to an internal combustion engine, the system having an oxygen sensor element of the concentration cell type, which is disposed in an exhaust passage of the engine and has a laminate of a measurement electrode layer exposed to exhaust gas, a microscopically porous layer of an oxygen ion conductive solid electrolyte and a reference electrode layer supported on a ceramic substrate, current supplying means for supplying a DC current to the sensor element to cause migration of oxygen ions in the solid electrolyte layer to thereby produce a reference oxygen partial pressure at the interface between the solid electrolyte layer and the reference electrode layer, and judgement means for producing an air/fuel ratio signal which indicates whether the air/fuel ratio is above or below the stoichiometric ratio of said air-fuel mixture by comparing a signal voltage which is substantially proportional to output voltage of the sensor element with a reference signal,

the improvement comprising said current supplying means comprising:

modification means for producing a modified voltage which is lower than said signal voltage by a predetermined value while said air-fuel ratio signal indicates that the air/fuel ratio is below said stoichiometric ratio but is higher than said signal voltage by said predetermined value while said air/fuel ratio signal indicates that the air/fuel ratio is above said stoichiometric ratio;

smoothing means for smoothing said modified voltage to produce a smoothed voltage; and

current control means for controlling said DC current such that said DC current flows in said solid electrolyte layer from said reference electrode layer toward said measurement electrode layer and becomes smaller as said smoothed voltage becomes higher while said smoothed voltage is below a reference level, but flows in the reverse direction and becomes larger as said smoothed voltage becomes higher while said smoothed voltage is above said reference level.

4,440,622

INTEGRATION OF SHORT-CONTACT-TIME LIQUEFACTION AND CRITICAL SOLVENT DEASHING WITH GASIFICATION THROUGH METHANOL-TO-GASOLINE

Francis J. Derbyshire, Ewing, N.J.; Philip Varghese, Newtown, Pa., and Darrell D. Whitehurst, Titusville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,280
Int. Cl.³ C10G *1/00*; C07C *1/00*
U.S. Cl. 208—8 LE **19 Claims**

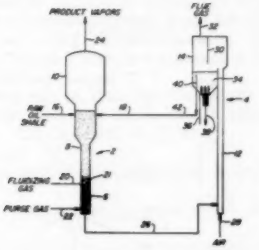
1. An integrated process for the conversion of solid coal to a wide slate of fuel products comprising: liquefying a portion of said coal by contacting said coal with a solvent to product dissolved coal liquids and an undissolved coal residue, separating a light SRC from said coal liquids by mixing said coal liquids with a light solvent under supercritical conditions of temperature and pressure, whereby said light solvent is converted to a dense-gas phase capable of dissolving said coal liquid, and varying the density of said dense-gas phase to precipitate out said light SRC, said light SRC having a hydrogen concentration greater than said coal feed and remaining portions of said coal liquid, upgrading said light SRC in the presence of hydrogen to produce a plurality of upgraded fuel products, gasifying a mixture of said residue and a portion of said coal liquids under oxidizing conditions to produce a synthesis gas comprising hydrogen and carbon monoxide, shifting the hydrogen to carbon monoxide ratio of said synthesis gas to produce a hydrogen gas stream, combining a portion of said hydrogen gas stream with said synthesis gas, converting said combined hydrogen gas stream and synthesis gas to methanol, passing at least a portion of said methanol in contact with a catalyst capable of converting said methanol to gasoline products, recycling at least one of the product streams for use in the integrated process, said recycle product streams including methanol or said gasoline products for use as said light solvent, light SRC or upgraded fuel products as said solvent for liquefying said coal, or said hydrogen gas stream to upgrade said light SRC or for inclusion with said solvent to liquefy said coal.

4,440,623

RECYCLE CLASSIFIER FOR RETORTING OIL SHALE

P. Henrik Wallman, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 30, 1982, Ser. No. 412,486
Int. Cl.³ C10G 1/02; C10B 53/06, 49/16
U.S. Cl. 208—11 R 8 Claims



1. A process for pyrolyzing a particulate oil shale containing at least 50 weight percent particles of non-fluidizable size which comprises:

(a) mixing in the upper part of a retorting zone the particulate oil shale with a hot fluidizable particulate heat transfer material in a ratio sufficient that at least 60 weight percent of the particles in the mixture are fluidizable;

(b) passing an inert gas upwardly in the upper part of the retorting zone at a velocity above the minimum fluidization velocity of the fluidizable particles through the mixture of oil shale and heat transfer material, whereby a fluidized zone composed of particles of fluidizable size is established in the upper part of the retorting zone;

(c) collecting in the lower part of the retorting zone below the fluidized zone particles of both fluidizable and non-fluidizable size which have passed through said fluidized zone, whereby a packed bed of solids is established below said fluidized zone;

(d) pyrolyzing in the retorting zone the kerogen in the oil shale to release hydrocarbon vapors which are recovered as product vapors;

(e) introducing a purge gas into said packed bed to carry hydrocarbon vapors out of lower part of said retorting zone;

(f) withdrawing solids comprising a mixture of heat transfer material and pyrolyzed oil shale from the bottom of the retorting zone;

(g) recovering from the mixture of heat transfer material and pyrolyzed oil shale a fluidizable fraction of particles within a preselected size range;

(h) heating the fluidizable fraction of step (f) to form hot heat transfer material;

(i) and recycling the hot heat transfer material of step (e) back to the retorting zone for admixture with additional particulate oil shale.

4,440,624

STARTING PITCHES FOR CARBON FIBERS

Seiichi Uemura, Tokyo; Shunichi Yamamoto; Takao Hirose, both of Kamakura; Hiroaki Takashima, Kawasaki, and Osamu Kato, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1982, Ser. No. 435,617
Claims priority, application Japan, Oct. 23, 1981, 56-168606
Int. Cl.³ C10C 3/00; C01B 31/02
U.S. Cl. 208—22 6 Claims

1. A starting pitch for carbon fibers, obtained by mixing 100 parts by weight of (1) a heavy fraction oil boiling at not lower than 200° C. obtained at the time of steam cracking of petroleum with (2) 10–200 parts by weight of wax having an average molecular weight of 250–1000 to form a mixture and then heat treating the thus obtained mixture at 360°–480° C. under a pressure of 2–50 Kg/cm².G thereby to obtain the starting pitch for carbon fibers, the starting pitch so obtained being heat treated to produce a precursor pitch which is melt spun, infusibilized, carbonized or graphitized to obtain the carbon fibers.

4,440,625

METHOD FOR MINIMIZING FOULING OF HEAT EXCHANGES

Ting S. L. Go, Houston, and Richard F. Miller, Humble, both of Tex., assignors to Atlantic Richfield Co., Los Angeles, Calif.

Continuation-in-part of Ser. No. 305,240, Sep. 24, 1981, abandoned. This application May 25, 1983, Ser. No. 497,983
Int. Cl.³ C10G 9/16
U.S. Cl. 208—48 AA 18 Claims

7. An antifoulant composition comprised of

(a) about 70 to 95 parts by weight of an inert organic solvent and

(b) about 5 to 30 parts by weight of a mixture comprised of:

(1) about 10 to 90 parts by weight of at least one N,N-dialkylhydroxylamine wherein the alkyl groups are the same or different and each alkyl group has 2 to 10 carbon atoms, and

(2) about 90 to 10 parts by weight of at least one organic surfactant.

11. In a method of inhibiting fouling in petroleum processing equipment comprising injecting into a petroleum or petroleum derivative feed stream to said equipment an amount of antifoulant effective to substantially reduce the rate of fouling, the improvement comprising using as the antifoulant a composition comprised of: (a) about 10 to 90 parts of at least one N,N-dialkylhydroxylamine wherein the alkyl groups are the same or different and each alkyl group has 2 to 10 carbon atoms, and (b) about 90 to 10 parts of at least one organic surfactant, based on the total weight of N,N-hydroxylamine and surfactant in said composition.

4,440,626

CATALYTIC REFORMING PROCESS

William E. Winter, and Gerald E. Markley, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 473,957, Mar. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 336,495, Dec. 31, 1981. This application Apr. 6, 1983, Ser. No. 482,509
Int. Cl.³ C10G 35/06
U.S. Cl. 208—65 23 Claims

1. In a process for reforming, with hydrogen, a naphtha feed in a reforming unit having at least one catalyst-containing on stream reactor through which the hydrogen and naptha are heated and flowed to contact the catalyst at reforming conditions, the improvement comprising

concentrating within the most rearward reaction zone of the reactor at least 40 percent to about 90 percent, based on the total weight of catalyst in said reactor, of a rhenium promoted platinum catalyst, the weight ratio of rhenium:-platinum being at least about 1.5:1, and

concentrating within the most forward reaction zone of the reactor a platinum catalyst, or rhenium promoted platinum catalyst which contains rhenium in concentration providing a weight ratio of rhenium:platinum up to about 1.2:1.

4,440,627

CATALYTIC REFORMING PROCESS

Gerald E. Markley, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 473,956, Mar. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 336,422, Dec. 31, 1981. This application Apr. 6, 1983, Ser. No. 482,510

Int. Cl.³ C10G *35/06*

U.S. Cl. 208—65 **36 Claims**

1. In a process for reforming, with hydrogen, a naphtha feed in a reforming unit having at least one catalyst-containing on stream reactor through which the hydrogen and naphtha are heated and flowed to contact the catalyst at reforming conditions,

wherein from about 40 percent to about 90 percent, based on the total weight of catalyst in said reactor, of a rhenium promoted platinum catalyst, the weight ratio of rhenium:-platinum being at least about 1.5:1, is concentrated within the most rearward reaction zone of the reactor, and

wherein a platinum catalyst, or rhenium promoted platinum catalyst which contains rhenium in concentration providing a weight ratio of rhenium:platinum of up to about 1.2:1 is concentrated within the most forward reaction zone of the reactor,

the improvement comprising

maintaining a start-of-run temperature ranging from about 875° F. to about 935° F.

4,440,628

CATALYTIC REFORMING PROCESS

William E. Winter, and Gerald E. Markley, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 473,954, Mar. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 409,073, Aug. 18, 1982, which is a continuation-in-part of Ser. No. 336,495, Dec. 31, 1981. This application Apr. 6, 1983, Ser. No. 482,511

Int. Cl.³ C10G *35/06*

U.S. Cl. 208—65 **34 Claims**

1. In a process for reforming, with hydrogen, a naphtha feed in a reforming unit which contains a plurality of catalyst-containing on stream reactors connected in series, the most rearward reactors of the series containing at least about 30 percent, based on the total weight of catalyst in all of the reactors of the unit, of a rhenium promoted platinum catalyst, the weight ratio of rhenium:platinum of which is at least about 1.5:1, the hydrogen and naphtha being heated and flowed from one reactor to another to contact the catalyst contained therein at reforming conditions, the reaction being continued over a period of at least about 700 hours, the catalyst gradually becoming less active due to coke deposition thereupon, and wherein the loss of activity caused by the coke deposition is compensated for during this period by gradually increasing the temperature of the hydrogen and naphtha feed to the reactors,

the improvement comprising

conducting the reaction at temperatures ranging from about 850° F. to about 950° F. (E.I.T.), at pressures ranging from about 150 psig to about 350 psig, and at gas rates ranging from about 2500 SCF/B to about 4500 SCF/B.

4,440,629

HYDROCARBON HYDROCRACKING PROCESS

Laurence O. Stine, Western Springs, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 13, 1982, Ser. No. 417,320

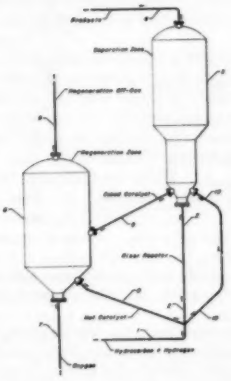
Int. Cl.³ C10G *47/28*

U.S. Cl. 208—111 **12 Claims**

1. A process for hydrocracking hydrocarbon feedstocks to lower boiling components which comprises:

(a) combining said hydrocarbon feedstock and hydrogen containing gas with hot solid zeolitic active catalyst particles, the weight ratio of catalyst to oil being within the range between 1 and 15, with hydrogen pressure being maintained within the range between 200 psig and 2000 psig, to form a suspension;

(b) passing said suspension through a riser reaction zone at a temperature between about 600° F. and less than 1000° F. to catalytically crack said feedstock while avoiding thermal conversion of said feedstock and providing a hydrocarbon residence time between about 1 second and 10 minutes;



(c) separating and recovering said lower boiling components and said solid catalyst particles;

(d) regenerating at least a portion of the separated solid catalyst particles with a water-free oxygen-containing gas in a fluidized bed operated at conditions to produce regenerated catalyst and gaseous products consisting essentially of carbon monoxide and carbon dioxide; and

(e) returning at least a portion of the regenerated catalyst combined with the hydrocarbon feedstock and hydrogen.

4,440,630

PROCESS FOR SIMULTANEOUS HYDRODESULFURIZATION AND HYDRODEWAXING WITH A CATALYST OF CONTROLLED PORE SIZE AND METALS CONTENT

Stephen M. Oleck, Moorestown, and Robert C. Wilson, Jr., Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 346,439, Feb. 8, 1982. This application Sep. 30, 1982, Ser. No. 430,159

Int. Cl.³ C10G *47/20*

U.S. Cl. 208—111 **7 Claims**

1. A process for simultaneously catalytically hydrodesulfurizing and hydrodewaxing a petroleum residual oil or other suitable petroleum base stock, said process consisting essentially of contacting a mixture of hydrogen and said residual oil at a hydrogen pressure of from about 500 to 3,000 psig, a temperature of from about 600° to 850° F. and a space velocity of from about 0.1 to 5.0 LHSV with a catalyst consisting essentially of 15–25 wt. % of a ZSM-5 type zeolite, 90–70 wt. % of alumina, based on alumina plus zeolite, and a metal content of 10–25 wt. %, expressed as oxides, of at least one Group VIII metal selected from the group consisting of nickel, cobalt and iron, and at least one Group VIB metal, based on total catalyst, said catalyst having about 80% of its pore volume in pores no greater than 100 Angstrom units in diameter and at least 90% of its pore volume in pores no greater than 150 Angstrom units in diameter and having a metal content which is balanced with the amount of ZSM-5 type zeolite in the catalyst whereby an increase in the zeolite content is balanced with an increase in the metal content, and recovering an upgraded petroleum product characterized by the fact that its

650°–750° F. fraction has a sulfur content no higher than 0.3 weight percent and a pour point no higher than 0° F. and that at 775° F.+ fraction has a sulfur content no higher than 0.5 weight percent.

4,440,631

PROCESS FOR HYDROCRACKING HEAVY HYDROCARBON OILS AND CATALYST THEREFOR

Osamu Togari; Masatoshi Matsuda; Kenji Shimokawa, all of Yokohama, and Toshiji Makabe, Kawasaki, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Jun. 15, 1983, Ser. No. 504,439
Claims priority, application Japan, Jun. 15, 1982, 57-101378
Int. Cl.³ C10G *47/12, 47/10*
U.S. Cl. 208—112 **6 Claims**

1. A catalyst for hydrocracking heavy hydrocarbon oils, comprising:

a porous inorganic carrier composed mainly of alumina or titania; and

two or more catalytic metal components composited with said carrier, the metals of said catalytic metal components being either (a) V and at least one first auxiliary element selected from the group consisting of Zn, Fe, Co, Ni, Cu, Ag, Sn and Pb or (b) Mo and at least one second auxiliary element selected from the group consisting of Zn, Cu, Ag, Sn, Pb and the lanthanum-series elements,

said catalyst having at least 60% of its total pore volume in pores with a diameter of 200 Å or more, at least 40% of its total pore volume in pores with a diameter of 300 Å or more and not more than 20% of its total pore volume in pores with a diameter of at least 1000 Å.

5. A process for hydrocracking a heavy hydrocarbon oil, comprising contacting the heavy hydrocarbon oil with a catalyst at a temperature of 420°–480° C., a hydrogen pressure of 100–250 Kg/cm^2 and a liquid hourly space velocity of 0.1–10 hr^{-1}, said catalyst including a porous inorganic carrier composed mainly of alumina or titania, and two or more catalytic metal components composed with said carrier, the metals of said catalytic metal components being either (a) V and at least one first auxiliary element selected from the group consisting of Zn, Fe, Co, Ni, Cu, Ag, Sn and Pb or (b) Mo and at least one second auxiliary metal component selected from the group consisting of Zn, Cu, Ag, Sn, Pb and the lanthanum-series elements, and said catalyst having at least 60% of its total pore volume in pores with a diameter of 200 Å or more, at least 40% of its total pore volume in pores with a diameter of 300 Å or more and not more than 20% of its total volume in pores with a diameter of at least 1000 Å.

4,440,632

CATALYTIC CRACKING WITH REDUCED EMISSION OF NOXIOUS GAS

Iacovos A. Vasalos, Thessaloniki, Greece, and Eugene G. Wollaston, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 15, 1980, Ser. No. 187,612
Int. Cl.³ C10G *11/18*; B01J *37/14*
U.S. Cl. 208—113 **11 Claims**

1. A process for the fluidized catalytic cracking of a hydrocarbon feedstock containing organic sulfur compounds which comprises:

(a) cracking said feedstock in a reaction zone through contact with a particulate cracking catalyst;

(b) separating cracking products from cracking catalyst which is deactivated by sulfur containing coke deposits and passing said deactivated cracking catalyst to a stripping zone;

(c) contacting the deactivated cracking catalyst with an oxygen-containing gas in said stripping zone at a temperature in the range from about 550° to about 700° C. and reacting the oxygen with said sulfur-containing coke deposits to form products which include sulfur-containing gases, wherein the amount of oxygen introduced into said stripping zone is effective to remove at least about 10 weight percent of the sulfur content and less than about 30 weight percent of the carbon content of said sulfur-containing coke deposits, and wherein said weight percent of the sulfur content removed is greater than said weight percent of the carbon content removed;

(d) withdrawing an effluent gas from the stripping zone and combining said stripping zone effluent gas with said cracking products;

(e) withdrawing from the stripping zone cracking catalyst which is deactivated by modified coke deposits having a reduced sulfur content and passing said catalyst from the stripping zone to a regeneration zone;

(f) removing said modified coke deposits from the deactivated cracking catalyst in said regeneration zone by burning with an oxygen-containing regeneration gas, thereby regenerating and heating the cracking catalyst;

(g) recycling a stream of hot regenerated cracking catalyst from the regeneration zone to the stripping zone in an amount which is effective to maintain the temperature in said stripping zone within the range from about 550° to about 700° C. and to provide a recycle ratio of hot regenerated cracking catalyst to deactivated cracking catalyst within the range from about 0.05 to about 1.0; and

(h) withdrawing a stream of regenerated cracking catalyst from the regeneration zone and passing said regenerated cracking catalyst to the reaction zone.

4,440,633

PROCESS FOR SOLVENT DEASPHALTING HEAVY HYDROCARBON FRACTIONS

Yves Jacquin, Sevres; Manuel Gimenez-Coronado, Colombes, and Huynh Dai-Nghia, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 30, 1982, Ser. No. 373,595
Claims priority, application France, Apr. 30, 1981, 81 08837
Int. Cl.³ C10C *3/08*
U.S. Cl. 208—309 **8 Claims**

1. In a process for deasphalting a heavy hydrocarbon fraction containing asphaltenes, comprising the step of admixing said fraction with a deasphalting solvent, thereby forming a first liquid phase, being a hydrocarbons solution in said solvent and having a reduced asphaltene content, and a second liquid phase, being an asphalt fraction having an increased asphaltene content; separating said first and second liquid phases; and removing the solvent from said first liquid phase and recovering the resultant deasphalted oil,

the improvement wherein said admixing is effected in a contact zone, at least a portion of which is subjected to ultrasonic radiation.

4,440,634

ORGANIC SALT COMPOSITIONS IN EXTRACTION PROCESSES

Howard L. Mitchell, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 289,323, Aug. 3, 1981. This application Sep. 29, 1982, Ser. No. 426,665
Int. Cl.³ C10G *25/00*
U.S. Cl. 208—310 R **8 Claims**

1. A process for extracting aromatic and olefinic hydrocarbons from mixed liquid, vapor or gaseous feedstreams containing paraffins comprising contacting said feedstreams at a temperature in the range of about 20°–500° C., with a composition of matter, being a solid salt, of the formulae:

[C] [A]

wherein

[C] is a monovalent or divalent cation selected from the group consisting of the formulae:

$[R_4Q]$

$[R_3R'Q]$

$[R_3Q\text{-}L\text{-}QR_3]$, and

[A] is a monovalent or divalent anion or a solid polyanionic metal oxide selected from the group consisting of the formulae:

$[R''_4M]$

[AS]

$[R''_3M\text{-}L'\text{-}MR''_3]$

wherein

Q is independently N, P or AS;

R is independently selected from the group consisting of phenyl, naphthyl, biphenylyl, and their monochloro and monomethyl derivatives;

R' is independently selected from the group consisting of benzyl, naphthylmethyl, and their monochloro and monomethyl derivatives; linear and branched C_6-C_{12} alkyl; cyclopentyl, cyclohexyl, adamantyl, bicyclooctyl, their monomethyl, dimethyl, partially fluorinated and partially chlorinated derivatives;

R'' is independently selected from the group consisting of phenyl, naphthyl, phenoxy, naphthoxy, and their methyl, polymethyl, chloro, polychloro, fluoro and polyfluoro derivatives;

L is $—CH_2(p—C_6H_4)CH_2—$;

L' is $p—C_6H_4$;

M is B or Al;

[AS] comprises a solid polyanionic metal oxide in which the metal is independently selected from the group consisting of Al, Si, Ti, Zr, Th, Hf, W, B and mixtures thereof; and wherein the number of cations and anions are sufficient to render the salt electrically neutral.

4,440,635

PROCESS AND APPARATUS FOR THE RECOVERY OF CELLULOSE FIBERS FROM PAPER-PLASTIC MIXTURES

Haigh M. Reiniger, 320 Standish St., South Duxbury, Mass. 06901, assignor to Haigh M. Reiniger, Old Lyme and Toste W. Moller, Rowayton, both of, Conn., a part interest

Continuation of Ser. No. 25,010, Mar. 29, 1979, abandoned. This application Feb. 3, 1981, Ser. No. 231,263

Int. Cl.³ B02C *23/14*

U.S. Cl. 209—4 **34 Claims**

1. A process for reclaiming low density moisture absorbent materials from a material mixture, comprising:

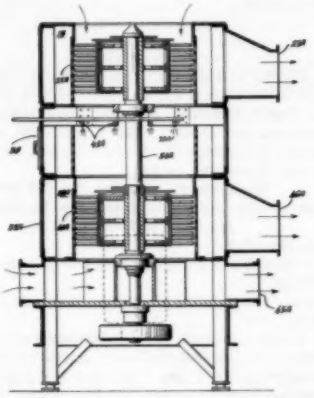
inputting a material mixture containing high and low density moisture inabsorbent and low density moisture absorbent materials

selectively and controllably applying moisturizers to said material mixture and increasing the moisture content of said material mixture to a predetermied value to moisturize said low density absorbent materials and increase the weight and density thereof to form high density moisturized materials and a moisture weighted material mixture;

establishing a centrifugal field and segregating said moisture weighted material mixture in said field to produce a high density fraction and a low density fraction;

partially fiberizing said high density moisturized materials to selectively reduce the size thereof;

separating said segregated high density fraction into an oversize and an undersized fraction; and collecting the



undersized fraction as recovered product and discharging the oversized fraction as an unreclaimed product.

4,440,636

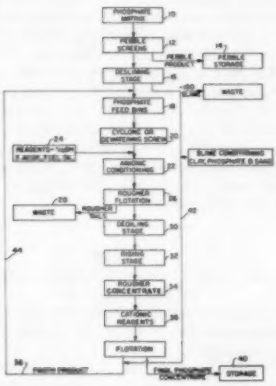
RECOVERY IN PHOSPHATE ORE FLOTATION PROCESS

George M. Lilley, Lakeland, Fla., assignor to J. Warren Allen, Lithia, Fla., a part interest

Filed Feb. 11, 1982, Ser. No. 347,694

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—10 **2 Claims**



1. The method of improving the recovery in a phosphate flotation process comprising the steps of:

treating the phosphate ore with an anionic reagent to float the phosphate ore as a phosphate overfloat;

removing the anionic reagent from the phosphate overfloat;

treating the phosphate overfloat with a cationic reagent to underfloat the phosphate and to overfloat a froth product containing limited amounts of phosphate;

treating the froth products with a slime under 150 mesh containing clay, silica and phosphate to at least partially deactivate the cationic reagent;

agitating the partially deactivated froth product with the slime to further deactivate the cationic reagent in the froth product; and

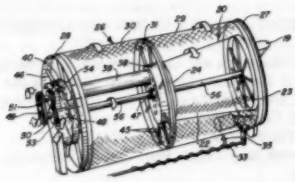
introducing the froth product into the phosphate flotation process prior to the adding of the anionic reagent.

4,440,637

ROTARY GRAIN SCREENERS

Edward H. Smit, Sheffield, and Eugene G. Sukup, Dougherty, both of Iowa, assignors to Sukup Manufacturing Co., Sheffield, Iowa

Filed Apr. 30, 1982, Ser. No. 373,699
Int. Cl.³ B07B *1/24*
U.S. Cl. 209—241 **14 Claims**



1. In a rotary grain screener which includes an inner drum including an annular coarse mesh screen and a plurality of axially spaced rim means supporting said coarse mesh screen, an outer drum including an annular fine mesh screen and a plurality of axially spaced rim means supporting said fine mesh screen, frame means supporting and journalling said drums for rotation about a common axis, and drive means for rotating said drums in opposite directions, said drive means comprising: a reverse drive transmission assembly including first and second members at one end of said outer drum and journalled for rotation about said common axis, a drive transmission between said first and second members at said one end for effecting rotation of one of said members in a direction opposite that of the other, a first component connected to said first member and disposed along said common axis, a second component connected to said second member and disposed along said common axis, first connecting means coupled to said first component and extending radially outwardly to one of said rim means of said inner drum, second connecting means coupled to said second component and extending radially outwardly to one of said rim means of said outer drum, a motive power source, and a second drive transmission assembly positioned and arranged for driving one of said drums from said motive power source to effect rotation thereof in one direction and rotation of the other of said drums in a reverse direction through said reverse drive transmission assembly.

4,440,638

SURFACE FIELD-EFFECT DEVICE FOR MANIPULATION OF CHARGED SPECIES

Millard M. Judy, and John L. Sutko, both of Dallas, Tex., assignors to U.T. Board of Regents, Austin, Tex.

Filed Feb. 16, 1982, Ser. No. 348,988
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—198.2 **7 Claims**

6. A device for chromatographic separation of charged species particles, comprising:

a device body having a plurality of grooves formed therein to define interconnecting channel paths therethrough and define lands between the channel grooves;

first and second electrically-isolated semiconductor regions formed on each of said lands;

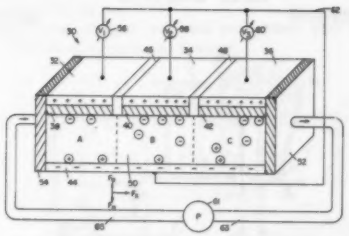
a cover of a silicon-based dielectric material overlaying said device body to make said grooves into fluid tight container regions;

means for defining a fluid inlet port to said device body in fluid communication with said interconnecting channel paths;

means for defining a plurality of fluid outlet ports from said device body in fluid communication with said interconnecting channel paths;

an electrically-conductive fluid containing charged species particles introduced into the device body channel paths through the fluid inlet port;

means connecting to each of said semiconductor regions for



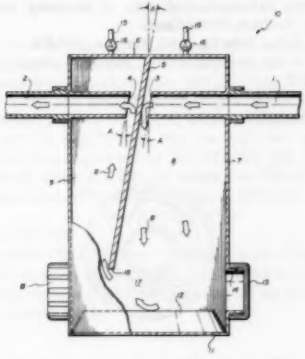
establishing an electrical potential thereon, so as to produce electric fields in said fluid that impose electrostatic forces on charged species particles in the fluid as it passes through said device body, whereby certain of the charged species particles move more slowly through the device body and exit an outlet port at a different time from other charged species particles in the fluid.

4,440,639

UNIVERSAL MAGNETIC ANGLED STRAINER

Charles W. Galuska, Lilac City Estates, 5 Fuchia Dr., Rochester, N.H. 03867

Filed May 12, 1982, Ser. No. 377,457
Int. Cl.³ B01D *35/06*; B03C *1/02*
U.S. Cl. 210—222 **9 Claims**



1. A device for separating magnetic particles from a fluid stream or the like comprising, in combination:

an enclosure,

an inlet and an outlet conduit means communicating with said enclosure,

a baffle means with said enclosure interposed between said outlet and inlet conduit means and angulated from vertical,

said baffle means dividing said enclosure into plural areas: an inlet area, a lower separation area, and an outlet area,

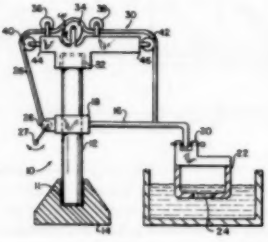
said separation area including a magnetic source to remove the magnetic particles from the fluid stream wherein open free ends of said inlet and outlet conduit means are within said enclosure and mouths of said free ends are disposed in parallel relationship with said interposed baffle.

4,440,640

HOIST TO BE USED IN COMBINATION WITH MOLTEN METAL FILTERING APPARATUS

Daniel E. Groteke, 8 E. Lakeview Dr., Apt. #4, Cincinnati, Ohio 45237, and Maurice R. Meeker, Monroe, Ohio, assignors to Daniel E. Groteke, Cincinnati, Ohio

Filed Apr. 14, 1982, Ser. No. 368,109
Int. Cl.³ B01D *29/38*
U.S. Cl. 210—237 12 Claims



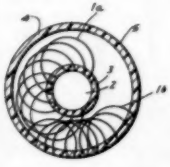
1. A hoist system comprising:
a stand;
a vertical member having a first end and a second end, said first end being mounted to said stand;
a coupling slidably connected to said vertical member;
an extension arm attached to said coupling;
means for raising and lowering said extension arm;
a molten metal filtering vessel; and
means for rigidly connecting said filtering vessel to said extension arm.

4,440,641

HOLLOW FILAMENT MODULE AND METHOD AND APPARATUS FOR PRODUCTION OF THE SAME

Karl Ostertag, Erlenbach, Fed. Rep. of Germany, assignor to Akzo NV, Arnhem, Netherlands

Filed Feb. 12, 1982, Ser. No. 348,455
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105192
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.3 14 Claims



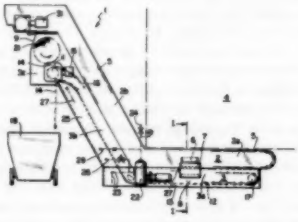
1. A hollow filament module comprising an annular package of hollow filaments having a longitudinal axis, an axially extending inner flow channel element of a hardened mass and an outer element likewise of hardened mass coaxial with the inner flow channel element and radially outwardly arranged from the latter, the hollow filaments forming said package being curved and of substantially equal lengths and extending in substantially radial direction in planes forming with said axis an angle of substantially 90°, the filaments in adjacent planes crossing each other at crossing points and engaging each other at said crossing points, each of said hollow filaments having two open ends embedded in the hardened mass of the respective element so that the open ends of at least some of the filaments are arranged to communicate with said axially extending inner flow channel element and the open ends of at least some of the filaments are arranged to communicate with the peripheral surface of said outer element and fluid will flow through the respective filaments.

4,440,642

SEPARATING AND CLEANING APPARATUS FOR COOLING LUBRICANT

Elmar Frese, Düsseldorf, and Gerhard Koch, Dortmund, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf and Mayfran GmbH, Essen, both of, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,597
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1981, 3127440
Int. Cl.³ B01D *33/22*
U.S. Cl. 210—387 7 Claims



1. An apparatus for returning cooling lubricant adhering to swarf produced when machining metals in a machine tool, said apparatus adapted to be positioned under a working bed of said machine tool, comprising:
a swarf conveyor comprising an endless conveyor belt, and a swarf conveyor guide frame guiding said conveyor belt, said swarf conveyor guide frame defining said swarf conveyor and having a straight substantially horizontal section with a free end to be positioned below said working bed and an ascending section terminating in a first discharge head whereby swarf removed from said cooling lubricant by said conveyor belt is discharged at said discharge head;
a filter unit for separating cooling lubricant from swarf comprising an endless scraper belt, and a filter unit guide frame guiding said endless scraper belt, said filter unit guide frame having a straight substantially horizontal section with a free end positioned below the straight substantially horizontal section of said swarf conveyor guide frame, and having an ascending section positioned below the ascending section of said swarf conveyor guide frame, said filter unit guide frame ascending section terminating in an upper and with a second discharge head;
a filter band storage roll disposed at said upper end of said filter unit and supplying filter band to an upper side of an upper run of said scraper belt, said filter band extending around said scraper belt and emerging as used filter band from said upper end of said filter unit;
a connection between said straight section of said swarf conveyor and said straight section of said filter unit for permitting cooling lubricant to flow from said swarf conveyor to said filter unit; and
a pump for producing a vacuum in said filter unit for drawing cooling lubricant through said filter band.

4,440,643

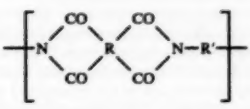
PROCESS FOR PRODUCING AROMATIC POLYIMIDE COMPOSITE SEPARATING MEMBRANE

Hiroshi Makino; Yoshihiro Kusuki; Takashi Harada; Hiroshi Shimazaki, and Tosio Isida, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Chiba, Japan

Filed Jun. 11, 1982, Ser. No. 387,493
Claims priority, application Japan, Jun. 22, 1981, 56-95389
Int. Cl.³ B01D *39/00, 39/14;* B05D *3/02*
U.S. Cl. 210—500.2 20 Claims

1. A process for producing an aromatic polyimide composite separating membrane, comprising the steps of:

coating at least one surface of a porous membrane substrate comprised of an aromatic polyimide which contains at least 80 molar % of at least one recurring unit of the formula (I):



(I)

wherein R represents an aromatic tetravalent radical and R′ represents an aromatic divalent radical, with a homogeneous solution containing 0.05% to 10% by weight of an aromatic polyamic acid dissolved in an organic polar solvent capable of dissolving said polyamic acid therein, but not capable of dissolving said polyimide membrane substrate, at a temperature of 140° C. or less, to form a thin layer of said polyamic acid solution; and

after or during drying said thin layer of said polyamic acid solution by evaporating said solvent therefrom, heating the resultant polyamic acid coating layer at a temperature of 150° C. or more, whereby the amideacid structure in said polyamic acid is imide-cyclized to convert said polyamic acid coating layer to the corresponding polyimide coating layer.

2. An aromatic polyimide composite separating membrane produced in accordance with the process as claimed in claim 1.

4,440,644

METHOD FOR THE BIOLOGICAL REMOVAL OF FREE AND COMPLEX CYANIDES AND THIOCYANATES FROM WATER

Terrence I. Mudder, Piedmont, and James L. Whitlock, Spearfish, both of S. Dak., assignors to Homestake Mining Company, Lead, S. Dak.

Filed Apr. 20, 1983, Ser. No. 486,610
Int. Cl.³ C02F *3/34, 3/08;* C12R *1/38;* C12N *1/20*
U.S. Cl. 210—611 3 Claims

1. A process for the biological degradation of cyanides, thiocyanates and metal cyanide complexes in an aqueous waste wherein organic matter dissolved in said waste acts as nutrients for growth of an aerobic flora, said process comprising:

acclimating in said aerobic flora at least one microorganism of the strain *Pseudomonas paucimobilis mudlock,* ATCC accession no. 39204; and

contacting the aqueous waste with the aerobic flora to degrade the cyanides, thiocyanates and metal cyanide complexes to environmentally acceptable products.

4,440,645

DISSOLVING GAS IN A LIQUID

Oliver A. Kite, West Wickham, England, assignor to The BOC Group plc, London, England

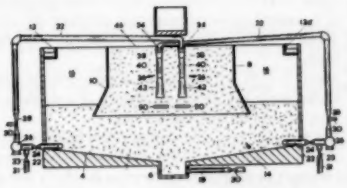
Filed Nov. 4, 1982, Ser. No. 439,498
Int. Cl.³ C02F *3/22*
U.S. Cl. 210—626 6 Claims

1. A method of treating sewage containing aerobic microorganisms in a single tank having a body of said sewage in the lower portion of said tank and clarified liquid thereabove comprising the steps of:

providing a skirt member having a lower open end extending upwardly from said body of sewage to define a volume of said sewage separate from an adjacent body of clarified liquid in said tank;

removing a flow of sewage from said body of sewage and pressurizing said flow;

introducing oxygen into said pressurized flow to form a mixture of oxygen and sewage;



introducing said mixture as a jet downwardly into the inlet of a chamber disposed in said volume defined by said skirt member to induce sewage in to said chamber and thereby oxygenate said sewage;

discharging said oxygenated sewage downwardly through an outlet of said chamber at a reduced velocity; and

reducing the momentum of said discharged oxygenated sewage by directing the same onto baffles spaced from the outlet of said chamber such that undissolved oxygen is substantially retained in said volume and is substantially precluded from entering said body of clarified liquid.

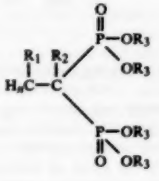
4,440,646

CHELATION

Edward G. Budnick, Scotch Plains, N.J., assignor to Plains Chemical Development Co., Roselle, N.J.

Continuation-in-part of Ser. No. 482,275, Aug. 24, 1965, Pat. No. 3,471,552, and a continuation-in-part of Ser. No. 818,802, Apr. 23, 1969, Pat. No. 3,892,676, which is a division of Ser. No. 485,624, Sep. 7, 1965, Pat. No. 3,471,406, and a continuation-in-part of Ser. No. 813,385, Feb. 27, 1969, abandoned, which is a division of Ser. No. 505,471, Oct. 28, 1965, abandoned. This application Jun. 3, 1971, Ser. No. 149,833
Int. Cl.³ C02F *5/14*
U.S. Cl. 210—699 23 Claims

1. A method of inhibiting the precipitation of scale-forming salts in an aqueous system comprising adding to said system at least a precipitating inhibition amount of an ethane diphosphonate having the formula



wherein

a. R_1 is chlorine;

b. R_2 is selected from the group consisting of chlorine, bromine and hydroxyl;

c. R_3 is alkali metal, ammonium or hydrogen;

d. n is an integer having a value of 2.

4,440,647

PAINT SPRAY BOOTH DETACKIFICATION COMPOSITION AND METHOD

Walter J. Puchalski, Southampton, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Feb. 9, 1983, Ser. No. 465,224

Int. Cl.³ B01D 21/01; C02D 1/20; C09D 9/00; C09K 3/00

U.S. Cl. 210—712 8 Claims

1. A composition for the detackification and clarification of paint spray booth paint wastes comprising, on a 100% actives basis:

a. about 3–15% by weight of a polymer formed by reaction of hexamethylene diamine and ethylene dichloride,

b. about 2–5% by weight of a polyamide - epichlorohydrin resin,

c. about 3–10% by weight of an amphoteric metal salt selected from the group consisting of soluble salts of zinc, iron, aluminum and lanthanum,

d. the remainder of said composition being water.

5. A process for controlling pollution and contamination in paint, lacquer or enamel spray booths in which water is used to wash air in said booth, and to remove over-sprayed paints, enamels or lacquers, said water being recirculated for further use in washing the air in said spray booths, said process comprising adding to said water an effective amount for the purpose of a detackifying composition comprising a polymer formed by reaction of hexamethylenediamine and ethylene dichloride, a polyamide-epichlorohydrin resin, and an amphoteric metal salt, said amount being sufficient to reduce the tackiness of said paints, enamels and lacquers and to thereby reduce the tendency of over-sprayed paints, enamels and lacquers to adhere to pump parts, mist eliminators, or sump sidewalls of said spray booths, said composition being effective to condition paint, enamel and lacquer solids so as to facilitate removal of said solids from said water.

4,440,648

PROCESS AND AN APPARATUS FOR ENRICHING LIQUIDS WITH OXYGEN

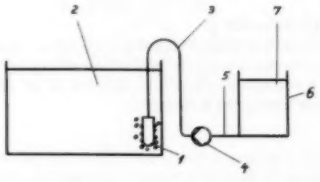
Klaus Gerlach, Aschaffenburg; Wolfgang Lange, Obernburg, and Dieter Loh, Erlenbach, all of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed Oct. 22, 1981, Ser. No. 313,755

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042281

Int. Cl.³ C02F 1/72

U.S. Cl. 210—759 8 Claims



1. A process for enriching liquids with oxygen by means of a catalyst and a liquid which gives off oxygen under the effect of that catalyst, comprising introducing approximately 0.1 up to 5% hydrogen peroxide solution as the oxygen-yielding liquid into a container, immersing said container, closed with a porous moulding in the pores of which is incorporated said catalyst, selected from the group consisting of ruthenium oxide and ruthenium hydroxide, into said liquid to be enriched with oxygen so that at least the entire porous molding is immersed, and allowing the oxygen-yielding liquid to pass through the porous molding under the effect of excess pressure building up in said container through the formation of oxygen therein, so that again oxygen is given off by said oxygen-yielding liquid, which oxygen for the most part is fed to the liquid to be enriched with oxygen.

4,440,649

WELL DRILLING AND COMPLETION FLUID COMPOSITION

Royal E. Loftin, and Adelina J. Son, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 28, 1982, Ser. No. 343,620

Int. Cl.³ C09K 7/02

U.S. Cl. 252—8.5 C 2 Claims

1. A well drilling and completion fluid composition consisting essentially of:

water;

sepiolite clay viscosity increasing agent present in said composition in an amount in the range of from about 1 to about 50 pounds per barrel of composition;

vinylamide-vinylsulfonate terpolymer fluid loss reducing and rheology stabilizing agent present in said composition in an amount in the range of from about 1 to about 30 pounds per barrel of composition, said terpolymer being prepared by the reaction of 2-acrylamide-2 methyl-3-propyl sodium sulfonate, vinylacetamide and acrylamide monomers;

sodium hydroxide present in said composition in an amount in the range of from about ¼ to about 2 pounds per barrel of composition; and

potassium acetate clay stabilizing agent present in said composition in an amount in the range of from about 1 to about 100 pounds per barrel of composition.

4,440,650

PROCESS FOR ENHANCING RECOVERY OF OIL FROM OIL-BEARING EARTH FORMATIONS

James M. Watson, and James R. Butler, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Nov. 2, 1981, Ser. No. 317,213

Int. Cl.³ C09K 3/00

U.S. Cl. 252—8.55 D 7 Claims

1. A process for enhancing oil recovery from oil-bearing earth formations, comprising the steps of:

(a) collecting H_2S-containing wellhead gas from an existing well;

(b) concentrating the H_2S from the wellhead gas, said concentrating step comprising extracting the H_2S from the wellhead gas with an organic amine and thereafter distilling the H_2S from the amine;

(c) oxidizing the concentrated H_2S to SO_3 at the well site;

(d) reacting the SO_3 with crude petroleum at the well site to produce a sulfonated petroleum mixture, said crude petroleum being recovered from an operating well located in the same field as the well from which the H_2S-containing wellhead gas is recovered;

(e) adding a neutralizing agent to the sulfonated mixture to form a surface active petroleum sulfonate salt mixture;

(f) incorporating the petroleum sulfonate salt mixture into an oil recovery enhancing fluid; and

(g) injecting the oil recovery enhancing fluid into an oil-bearing earth formation.

4,440,651

USE OF PEROXIDE IN WATERFLOOD OIL RECOVERY

William P. Weisrock, Broken Arrow, Okla., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 184,831, Sep. 8, 1980, abandoned. This application Nov. 9, 1981, Ser. No. 319,336

Int. Cl.³ E21B 43/22

U.S. Cl. 252—8.55 D 9 Claims

1. A process for displacing crude oil within an oil-bearing formation penetrated by at least one injection well in fluid communication with at least one producing well, comprising injecting from about 0.1 to about 0.5 pore volume of aqueous

fluid into said formation through said at least one injection well to move said oil to said at least one producing well, said volume of aqueous fluid containing from about 0.1 weight percent to about 3.0 weight percent peroxide.

4,440,652

PROCESS FOR SECONDARY RECOVERY

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 245,875, Mar. 23, 1981, abandoned, which is a division of Ser. No. 122,323, Feb. 19, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,982

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D 8 Claims

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(A) injection into the formation via an injection well a drive fluid comprising water having dissolved therein about 0.01 to about 5.0 weight percent of an N-substituted polyacrylamide bearing N-substituents of the formula:

$$-(CH_2CH_2O)_{m-1}CH_2CH_2SO_3M,$$

wherein m is an integer of from 2 to 5 and M is selected from the group consisting of hydrogen, sodium, potassium and ammonium, wherein the number average molecular weight of the N-substituted polyacrylamide is about 10,000 to about 8,000,000,

(B) forcing the fluid through the formation, and

(C) recovering hydrocarbons through the production well.

4,440,653

HIGHLY STABLE ALCOHOL FOAMS AND METHODS OF FORMING AND USING SUCH FOAMS

James E. Briscoe; Phillip C. Harris, and Glenn S. Penny, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 8, 1982, Ser. No. 355,990

Int. Cl.³ C09K *7/00;* E21B *43/16*

U.S. Cl. 252—8.55 R 32 Claims

9. A method of treating a water-sensitive subterranean formation wherein a treating fluid foreign to the formation is introduced therein comprising the steps of:

forming a foamed treating fluid having a vapor phase and having a liquid phase comprised of one or more alcohols or aqueous solutions thereof and a nonionic foam-forming surfactant or mixture of nonionic surfactants having the structural formula:

$$F-(CF_2)_x-CH_2CH_2O-(CH_2\underset{\displaystyle R}{\underset{|}{C}}HO)_y-(CH_2\underset{\displaystyle R_1}{\underset{|}{C}}HO)_z-R_2$$

wherein:

x is an integer from 2–12 or an integer or fractional integer representing an average value of from 2–12;

y and z are each individually an integer from 0–20 or an integer or fractional integer representing an average value of from 0–20;

R and R_1 are each individually hydrogen or an aliphatic hydrocarbon radical containing from 1–4 carbon atoms; and

R_2 is hydrogen or an ester group of the formula

wherein R_3 is an aliphatic hydrocarbon radical containing from 1–4 carbon atoms; and

introducing said foamed treating fluid into said formation.

4,440,654

COOLING EMULSION AND METHOD OF PRODUCING A COOLING EMULSION

Henry Zimzik, Kirchstrasse 7, 5419 Marienhausen, Fed. Rep. of Germany

Filed Apr. 1, 1982, Ser. No. 364,505

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113724; Aug. 20, 1981, 3132886

Int. Cl.³ C10M *3/26*

U.S. Cl. 252—34.7 20 Claims

1. A method for producing a cooling emulsion, particularly for use as an auxiliary means in boring, cutting, and grinding in the metalworking industry, in which organic substances which are per se immiscible with water are rendered water-dispersible and are emulsified with water, comprising:

mixing

(a) about 3% to 15% by weight of natural animal or vegetable wax,

(b) 0.1% to 0.45% by weight of emulsifier, and

(c) the remainder, an aqueous di-, tri-ethanolamine mixture comprising about 50% by weight of water, 37.5% by weight of diethanolamine and about 12.5% by weight of triethanolamine,

bringing the resulting mixture to a boil while stirring to emulsify the wax component and initiate aminization,

then cooling the mixture in a first cooling step to a reaction temperature of about 84° to 93° C., while stirring,

completing aminizing the wax component by the di-, triethanolamine mixture, and

then cooling the aminized emulsion in a second cooling step down to metalworking temperature.

16. A cooling emulsion for use in boring, cutting, and grinding, comprising:

(A) 2.5% to 5% by weight of a reacted emulsion of

Parts by Weight	Ingredient
3 to 15%	natural wax
0.1 to 0.45%	emulsifier
remainder	di-, triethanolamine mixture,

said di-,tri-ethanol mixture consisting essentially of

Parts by Weight	Ingredient
50%	water
37.5%	diethanolamine
12.5%	triethanolamine

(B) 97.5% to 95% by weight of water, with the pH of the emulsion being pH 8 to 9.

4,440,655

SULFUR-CONTAINING MANNICH BASES AND LUBRICANTS CONTAINING SAME

Robert M. Gemmill, Jr., Pitman, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 280,736, Jul. 8, 1981, abandoned. This application Jul. 15, 1982, Ser. No. 398,534

Int. Cl.³ C10M *1/20, 1/32, 1/38*

U.S. Cl. 252—47.5 27 Claims

1. A product of reaction made by reacting an aldehyde, at least one amine selected from (1) amines of the formula

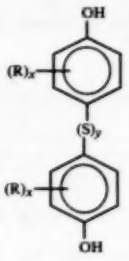
NHZR″

wherein R″ is a C_{10} to C_{28} hydrocarbyl or hydroxyalkyl group and Z is hydrogen or R″, (2) cyclic amines having at least 6

carbon atoms in the ring, and (3) an alkylolamine of the formula:

$$HOR'''NHM$$

wherein R''' is a C_2–C_6 alkyl group and M is hydrogen or —R'''OH, and at least one thiodiphenol of the formula:



wherein R is a C_1–C_{30} hydrocarbyl group, x is 0 to 2 and y is 1 to 3, the reaction being carried out at from about 80° C. to about 150° C. and said thiodiphenol, aldehyde and amine are used in molar ratios of 1.0:0.1–10:0.1–10, respectively.

4,440,656

BORATED ALKOXYLATED ALCOHOLS AND LUBRICANTS AND LIQUID FUELS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,519
Int. Cl.³ C10L 1/18, 1/30; C10M 1/20, 1/54
U.S. Cl. 252—49.6 **18 Claims**

1. A product of reaction obtained by reacting, at from about 90° C. to about 280° C., an alkoxylated alcohol of the formula

$$RO(R'O)_xH$$

wherein R is a hydrocarbyl group containing 9 to 18 carbon atoms, R' is a hydrocarbylene group containing 2 to 4 carbon atoms and x is 1 to 7 with boron oxide or another boron compound of the formula

$$(R''O)_xB(OH)_y$$

wherein R'' is an alkyl group containing 1 to 6 carbon atoms, x is 0 to 3 and y is 0 to 3, the sum of x and y being 3, the said product of reaction containing from about 0.1% to about 10% by weight of boron.

4,440,657

SYNTHETIC ESTER LUBRICATING OIL COMPOSITION CONTAINING PARTICULAR T-BUTYLPHENYL SUBSTITUTED PHOSPHATES AND STABILIZED HYDROLYTICALLY WITH PARTICULAR LONG CHAIN ALKYL AMINES

Stephen J. Metro, Scotch Plains, and Dale D. Carr, Morristown, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 1, 1982, Ser. No. 413,894
Int. Cl.³ C10M 3/40
U.S. Cl. 252—49.9 **12 Claims**

1. A synthetic ester lubricating oil composition comprising a major amount of synthetic ester base oil, from about 0.1 to about 5% by weight, based on the weight of lubricating oil composition of a phosphate ester having the formula:

$$(RO)_3PO$$

with each R being phenyl or t-butylphenyl provided at least one R group is t-butylphenyl, and from about 0.001 to about 0.1% by weight, based on the weight of lubricating oil composition, of an alkyl amine having the formula:

$$NR_1R_2R_3$$

where each of R_1, R_2 and R_3 is a long chain alkyl group of about 16 to about 36 carbon atoms or hydrogen provided at least one of R_1, R_2 and R_3 is said alkyl group and the total number of carbon atoms is about 24 to about 60, said synthetic ester base oil being selected from the group consisting of:

(a) simple esters derived from monohydric aliphatic alcohols having from about 1 to about 18 carbon atoms and monobasic aliphatic acids having from about 2 to about 22 carbon atoms;

(b) complex esters formed from the reaction of three or more of the following compounds:

(i) monohydric aliphatic alcohols having about 1 to about 18 carbon atoms;

(ii) monobasic aliphatic acids having about 2 to about 22 carbon atoms;

(iii) aliphatic glycols or polyglycols having about 2 to about 70 carbon atoms;

(iv) polyhydric aliphatic alcohols having about 4 to about 25 carbon atoms;

(v) dibasic aliphatic acids having about 2 to about 25 carbon atoms;

(vi) polybasic aliphatic acids having about 3 to about 30 carbon atoms, wherein at least one polyfunctional alcohol and at least one polyfunctional acid are employed; and

(c) polyolesters derived from polyhydric aliphatic alcohols containing from about 2 to about 10 hydroxyl groups and about 4 to about 25 carbon atoms and monobasic aliphatic acids having from about 2 to about 22 carbon atoms.

4,440,658

ANTI-RUST COMPOSITIONS

Alfred B. Piotrowski, and Richard S. Herd, both of Woodbury, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 16, 1981, Ser. No. 225,574
Int. Cl.³ C10M 1/32
U.S. Cl. 252—51.5 A **7 Claims**

1. A lubricant comprising a major amount of a grease or other solid lubricant prepared from an oil of lubricating viscosity and a minor amount, of an anti-rust additive compound sufficient to inhibit rust formation on metal surfaces contacting said grease, of a t-alkyl primary amine salt of a monoalkylimidazolylethyl phthalate or mixtures thereof wherein said alkyl group contains from about 1 to about 30 carbon atoms and wherein a first compound is prepared by reacting equi-molar amounts of phthalic anhydride and an imidazoline, and thereafter reacting equi-molar amounts of said first compound and a t-alkyl primary amine.

4,440,659

LUBRICATING OIL ASHLESS DISPERSANT AND LUBRICATING OILS CONTAINING SAME

Jackson C. Chen, Troy; Marguerite S. Bayierian, Huntington Woods; Bryan T. Davis, West Bloomfield, and Ellis B. Rifkin, Southfield, all of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Feb. 19, 1982, Ser. No. 350,206
Int. Cl.³ C10M 1/32
U.S. Cl. 252—51.5 A **20 Claims**

1. An ashless dispersant suitable for use in lubricating oil, said dispersant being made by a process comprising

(I) heating a mixture of reactants consisting essentially of 100 parts by weight of a Bright Stock mineral oil, about 1–25 parts by weight of a C_{1-20} alkyl acrylate or methacrylate and about 1–25 parts by weight of maleic anhydride in the presence of a free radical-generating catalyst at a

temperature high enough to form free radicals up to about 250° C. to form a succinic grafted intermediate, and

(2) reacting said intermediate with an amine containing 1–30 carbon atoms and 1–6 amine groups, at least one of said amine groups being a primary or secondary amine group, the amount of said amine being sufficient to provide at least one primary or secondary amine group for each grafted succinic group at a temperature high enough to cause the formation of succinamide or succinimide groups up to about 250° C.

10. A composition comprising a major amount of an oil of lubricating viscosity and a dispersing amount of an ashless dispersant of claim 1.

4,440,660
ESTER LUBRICANTS

Gerrit A. van Rijs, Zevenhuizen; Arie D. Kardol, Waddinxveen, and Adriën G. Hinze, Dordrecht, all of Netherlands, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Jun. 8, 1982, Ser. No. 386,264

Claims priority, application Netherlands, Jun. 9, 1981, 8102759

Int. Cl.³ C10M *1/22, 1/24*

U.S. Cl. 252—56 S **11 Claims**

1. Ester mixture suitable for use in lubricating a car engine consisting of:

(A) 60–95 mol-% diesters of a 2-alkyl-substituted propane diol-1,3 and a mixture of C_6–C_{10}- and C_{12}–C_{18}-monocarboxylic acids;

(B) 0–40 mol-% diesters of a C_5–C_{15}-ether diol and a mixture of C_6–C_{10}- and C_{12}–C_{18}-monocarboxylic acids;

(C) 5–35 mol-% triesters derived from a trimethylol alkane (C_1–C_4) and a mixture of C_6–C_{10}- and C_{12}–C_{18}-monocarboxylic acids, the molar percentage of C_6–C_{10}-monocarboxylic acid to C_{12}–C_{18}-monocarboxylic acid in the mixture of acids used to make the esters (A), (B) and (C) being 20–50:80–50.

4,440,661
POWDERED CLEANING COMPOSITION

Shoji Takeuchi, Higashimurayama; Kozaburo Nishiyama, Fuchu, and Tadashi Gomi, Fussa, all of Japan, assignors to Fuji Kasei Co., Ltd. and Yuho Chemicals Inc., both of Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,860

Claims priority, application Japan, Oct. 16, 1981, 56-164253

Int. Cl.³ C11D *7/52*

U.S. Cl. 252—89.1 **14 Claims**

1. A powdered cleaning composition for cleaning in the dry state comprising:

a carrier comprised of 20 to 50 wt. % based on the carrier of an organic fiber having a length of from 110 to 1000 microns and 50 to 80 wt. % based on the carrier of an amino aldehyde resin;

and adsorbed in said carrier at least one surfactant and water wherein said surfactant is present in an amount of 0.01 to 40 wt. % based on the carrier and said water is present in amount of 20 to 250 wt. % based on the carrier.

4,440,662
CLEANING COMPOSITION FOR CONTACT LENSES

Akira Tsuzuki; Takeo Kibe, both of Nagoya, and Shunichi Hioki, Ichinomiya, all of Japan, assignors to Toyo Contact Lens Co., Ltd., Nagoya, Japan

Filed Sep. 13, 1982, Ser. No. 417,477

Claims priority, application Japan, Oct. 22, 1981, 56-167897

Int. Cl.³ C11D *1/44, 1/825*

U.S. Cl. 252—106 **13 Claims**

1. A cleaning composition for contact lenses, which comprises, as the major component a mixture of (A) at least one member selected from the group consisting of (a), polypropyleneoxide-polyethyleneoxide block copolymers having an ethyleneoxide content of from 33 to 55% by weight and a molecular weight of from 1,500 to 10,000 and (b) condensation products of polypropyleneoxide-polyethyleneoxide block copolymers with ethylene diamine having an ethyleneoxide content of from 35 to 55% by weight and a molecular weight of from 1,500 to 10,000 and (B) at least one member selected from the group consisting of (a_1) polypropyleneoxide-polyethyleneoxide block copolymers having an ethyleneoxide content of from 70 to 90% by weight and a molecular weight of at least 4,000 and (b_1) condensation products of polypropyleneoxide-polyethyleneoxide block copolymers with ethylene diamine having an ethyleneoxide content of from 70 to 90% by weight and a molecular weight of at least 4000, wherein the weight ratio of (A):(B) is from 10:1 to 1:30.

4,440,663
ALKALINE AQUEOUS LIQUID DETERGENT COMPOSITIONS CONTAINING NORMALLY UNSTABLE ESTER PERFUMES

Stanton L. Boyer, and Charles A. Schulz, both of Fairfield, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 301,673, Sep. 14, 1981, abandoned. This application Oct. 8, 1982, Ser. No. 433,492

Int. Cl.³ C11D *1/66, 3/20, 3/50*

U.S. Cl. 252—174.11 **12 Claims**

1. An alkaline aqueous liquid detergent composition comprising:

(a) from about 7% to about 30% of zeolite A detergency builder;

(b) from about 5% to about 40% of a water-soluble or water-dispersible soap of unsaturated fatty acids containing from about 16 to 22 carbon atoms;

(c) from about 1% to about 30 of a nonionic surfactant;

(d) from about 5% to about 15% of a water-soluble polycarboxylate detergency builder capable of sequestering calcium and magnesium ions in water solution;

(e) from about 0.01% to about 4% of a perfume material comprising from about 4% to about 90% of the total weight of the perfume of normally unstable ester compounds; and

(f) from about 20% to about 82% water; wherein said composition is substantially free of synthetic anionic surfactants.

4,440,664
PROCESS FOR THE DISPERSION OF CHAIN EXTENDER IN POLYOL

Mark A. Pollock, Johnson City, and Jimmie D. Fleenor, Gray, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,543

Int. Cl.³ C09K *3/00*; C08G *18/10*

U.S. Cl. 252—188.31 **8 Claims**

1. A process for preparing dispersions of hydroquinone di(β-hydroxyethyl)ether in polyurethane-forming polyol comprising the steps of:

(a) heating and blending an initial mixture of about 5 to 30 parts by weight of said ether and about 10 to 50 parts by weight of said polyol until a condensed phase is formed by the melting of said ether at a temperature of at least about 90° C.;

(b) combining with said initial mixture an additional quantity of polyol sufficient to bring the total amount of polyol in the resulting dispersion to about 100 parts by weight, the additional polyol being at a temperature substantially below that of said initial mixture so that the addition thereof to said initial mixture results in adiabatic quenching of the resulting dispersion to a temperature in the range of about 70° to 85° C.;

(c) annealing said dispersion by heating said dispersion to a

temperature which is at least about 5° C. greater than the quenching temperature and which is in the range of about 84° to 90° C.; and

(d) cooling said dispersion to a desired handling temperature which is less than about 60° C.

4,440,665

CONCENTRATED AQUEOUS SURFACTANT COMPOSITIONS

Douglas E. Mather, Whitehaven; Edward T. Messenger, Workington, and Brinley M. Phillips, Whitehaven, all of England, assignors to Albright & Wilson Limited, Warley, England

Filed May 25, 1979, Ser. No. 42,351

Claims priority, application United Kingdom, May 26, 1978, 22991/78

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.³ B01F *17/28;* C11D *3/33*

U.S. Cl. 252—356 10 Claims

1. An aqueous surfactant composition consisting essentially of at least 20% but not more than 55% by weight of water, and an active mixture consisting of at least 5% by weight of said mixture, of a first, amphoteric surfactant with at least 5% by weight of said mixture of at least 1 surfactant selected from the group consisting of nonionic surfactants and amphoteric surfactants non-homologous with said first amphoteric surfactant, said mixture being capable of forming a "G" phase in the presence of water and the concentration of active ingredient in said composition corresponding to that at which the composition can exist, at least predominantly in the "G" phase.

4,440,666

METHOD OF MAKING CORROSION INHIBITING POLYAMINE AMIDES, THE AMIDES, AND USE THEREFOR

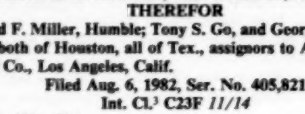
Richard F. Miller, Humble; Tony S. Go, and George R. Wilson, III, both of Houston, all of Tex., assignors to Atlantic Richfield Co., Los Angeles, Calif.

Filed Aug. 6, 1982, Ser. No. 405,821

Int. Cl.³ C23F *11/14*

U.S. Cl. 252—392 28 Claims

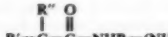
1. A corrosion inhibitor for hydrocarbonaceous liquid processing systems comprised of an amide having the structural formula:



wherein R is a straight or branched chain alkylene group having 2 to 6 carbon atoms; x is an integer of 0 to 12; R′, R″ and R‴ are the same or different alkyl groups and the average sum of the carbon atoms in R′, R″ and R‴ varies from 3 to 20, and R⁗ is an aliphatic hydrocarbon radical having 9 to 29 carbon atoms.

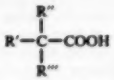
25. A process for preparing a corrosion inhibitor composition comprising reacting, at a temperature of about 50° to 250° C.,

(a) a polyamine having the structural formula



wherein R is a straight or branched chain alkylene group having 2 to 6 carbon atoms and x is an integer having a value of 0 to 12,

(b) a carboxylic acid having the structural formula



wherein R′, R″ and R‴ are alkyl groups and the average total sum of the carbon atoms in R′, R″ and R‴ is 3 to 20, and

(c) an aliphatic fatty acid having 10 to 30 carbon atoms.

4,440,667

CATALYST REGENERATION IN A CATALYTIC REFORMING PROCESS

William C. Baird, Jr.; Paul E. Eberly, Jr., and George J. Balinsky, all of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 394,669, Jul. 2, 1982, abandoned. This application Jan. 7, 1983, Ser. No. 456,512

Int. Cl.³ B01J *23/96*

U.S. Cl. 502—53 6 Claims

1. In a process for regeneration of a coked platinum-iridium catalyst promoted with a selenium, component which has been contacted with naphtha and the naphtha reformed for at least about 600 hours at semi-regenerative severities, the improvement comprising

contacting said coked catalyst with hydrogen at pressures ranging from about 100 psig to about 600 psig, at temperatures ranging from about 950° F. to about 1100° F., for a period ranging from about 0.5 hour to about 48 hours to remove coke from, and regenerate said coked catalyst.

4,440,668

CATALYST FOR THE CONVERSION OF SYNTHESIS GAS TO HIGHER ALCOHOLS

Clarence D. Chang, Princeton, and Patrick D. Perkins, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,403

Int. Cl.³ B01J *21/06, 23/72, 23/78*

U.S. Cl. 502—331 3 Claims

1. A catalyst for the production of alcohols from synthesis gas which consists essentially of the oxides of

(i) copper

(ii) cobalt

(iii) zirconium and

(iv) an alkali metal.

4,440,669

ELECTRICALLY CONDUCTING COMPOSITIONS OF DOPED POLYPHENYLENES AND SHAPED ARTICLES COMPRISING THE SAME

Dawn M. Ivory, Stanhope; Granville G. Miller, Morristown; Ronald R. Chance, and Ray H. Baughman, both of Morris Plains, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 22,237, Mar. 20, 1979, abandoned. This application Feb. 17, 1981, Ser. No, 234,511

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—518 22 Claims

1. A composition comprising a solid polymer consisting essentially of units having para-phenylene linkages, or of mixtures of such units with units having meta-phenylene linkages, and having incorporated therein

an electron donor doping agent selected from the group consisting of Group IA metals and Group IA metal arenes and mixtures thereof, or

an electron acceptor doping agent selected from the group consisting of Bronsted Acids, SO_3, N_2O_5, halides of Groups VIB, VIII, IIIA and VA; mixed halides and fluorine-containing peroxides and mixtures thereof, wherein:

(a) the direct current conductivity of the composition incorporating the electron donor agent alone is at least 10^{-3} ohm^{-1} cm^{-1}; and

(b) the direct current conductivity of the composition incorporating the electron acceptor agent alone, or in admixture with said electron donor agent, is at least 10^{-3} ohm^{-1} cm^{-1};

said conductivities being measured by the four-probe-in-line method at room temperature.

4,440,670

METHOD OF SYNTHESIZING HIGH SURFACE AREA UNAGGLOMERATED NOBLE METAL PYROCHLORE COMPOUNDS

Harold S. Horowitz, Edison, and Joseph T. Lewandowski, Middlesex, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 30, 1982, Ser. No. 430,237

Int. Cl.³ C01G *55/00*; H01B *1/08*

U.S. Cl. 252—518 **21 Claims**

1. A method of preparing compounds having the formula:

$$A_2[B_{2-x}A_x]O_{7-y}$$

wherein A is selected from the group consisting of lead, bismuth and mixtures thereof, wherein B is selected from the group consisting of ruthenium, iridium and mixtures thereof, wherein x is a value such that $0<x\leqq 1.0$ and y is a value such that $0\leqq y\leqq 1$, comprising:

(a) reacting A cations and B cations from an aqueous solution source of these cations in a liquid alkaline medium having a pH of at least about 12.0 in the presence of an oxygen source at a temperature below about 200° C. for a sufficient time to form a pyrochlore precipitate,

(b) displacing the liquid alkaline medium with water to form a slurry comprising water and pyrochlore precipitate, thereby avoiding contact of the precipitate thus formed with air;

(c) atomizing the slurry thus formed to produce a fine spray,

(d) contacting the spray thus formed with a freezing medium for a period of time sufficient to form a frozen powder comprising an intimate mixture of pyrochlore compound and ice slurried in the freezing medium,

(e) freeze drying the frozen powder thus formed to recover a pyrochlore compound of reduced agglomeration relative to that obtained in the absence of steps (c)–(e).

4,440,671

COMPOSITIONS OF HYDROCARBON-SUBSTITUTED DIPHENYL AMINES AND HIGH MOLECULAR WEIGHT POLYETHYLENE GLYCOLS; AND THE USE THEREOF AS WATER-TREE RETARDANTS FOR POLYMERS

Robert J. Turbett, Millington, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 362,959, Mar. 31, 1982. This application Feb. 23, 1983, Ser. No. 469,178

Int. Cl.³ H01B *3/18*

U.S. Cl. 252—573 **34 Claims**

1. A composition, which serves to improve resistance to water-treeing in polymeric compositions, comprising a hydrocarbon-substituted diphenyl amine and a high molecular weight polyethylene glycol.

13. A composition having improved resistance to water-treeing comprising an ethylene polymer, a hydrocarbon-substituted diphenyl amine in an amount of 0.2 to about 2 percent by weight and a polyethylene glycol, having a molecular weight of about 1,000 to about 20,000 in an amount of about 0.2 to about 1 percent by weight.

4,440,672

PHOTOCHROMIC COMPOSITION RESISTANT TO FATIGUE

Nori Y. C. Chu, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

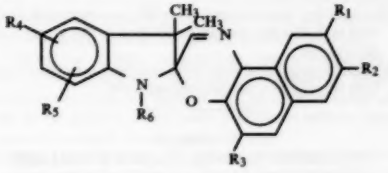
Filed Mar. 22, 1982, Ser. No. 360,455

Int. Cl.³ G02B *5/23*

U.S. Cl. 252—586 **26 Claims**

1. An organic photochromic composition comprising:

at least one photochromic compound having the structural formula:



wherein one of R_1, R_2, and R_3 is hydrogen, halogen, or lower alkoxy and the others are hydrogen, R_4 and R_5 are hydrogen, lower alkyl, lower alkoxy, or halogen, and R_6 is lower alkyl; and

an ultraviolet stabilizer belonging to the class of singlet oxygen quenchers.

4,440,673

METHOD OF AND APPARATUS FOR THE TREATMENT OF RADIOACTIVE WASTE WATER FROM NUCLEAR POWER PLANTS

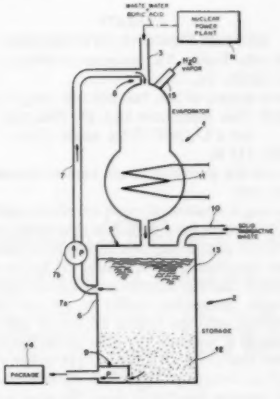
Rainer Ambros, Biblis; Norbert Brenner, Bürstadt, and Jürgen Fischer, Essen, all of Fed. Rep. of Germany, assignors to Rheinisch-Westfälisches Elektrizitätswerk AG, Essen, Fed. Rep. of Germany

Filed Mar. 20, 1980, Ser. No. 132,084

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911272

Int. Cl.³ G21F *9/14*

U.S. Cl. 252—632 **1 Claim**



1. A method of treating radioactive waste water from a nuclear reactor containing dissolved boric acid which comprises the steps of:

(a) concentrating radioactive waste water containing dissolved boric acid derived from a nuclear reactor in an evaporator to a boric acid concentration in a concentration below the boric acid saturation level at the tempera-

ture of the concentrate but above the saturated level of the concentrate for boric acid at room temperature;

(b) collecting the concentrate following step (a) at a temperature of at least 50° C. in a storage tank and permitting the concentrate in said storage tank to cool to room temperature and adding a radioactive solid waste containing diatomaceous earth to the tank, thereby precipitating boric acid solids from the concentrate in said tank and permitting the precipitate to sediment as a sludge therein;

(c) thereafter decanting clear concentrate from the sedimented boric-acid-containing sludge in said tank and recycling the decanted clear concentrate to the evaporator of step (a);

(d) repeating steps (b) and (c) while accumulating sludge in said tank thereby enabling radiation in the waste water to decay; and

(e) discharging the sludge from said tank upon its accumulation therein to a predetermined level.

4,440,674

SYNERGISTIC VINYL HALIDE STABILIZER COMPOSITIONS OF ANTIMONY ORGANIC SULFUR-CONTAINING COMPOUNDS, ALKALINE EARTH CARBOXYLATES AND ALKALI METAL CARBONATES

Dale J. Dieckmann, Cleveland, and Charles W. Fletcher, Highland Heights, both of Ohio, assignors to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 8, 1980, Ser. No. 176,473
Int. Cl.³ C08K *5/59*
U.S. Cl. 524—177 **22 Claims**

1. A vinyl halide resin composition which comprises a vinyl halide resin and, as a processing stabilizer, an effective amount of a composition consisting essentially of,

an antimony organic sulfur-containing compound having an Sb-S group, and mixtures thereof,

a metal carboxylate selected from the group consisting of an alkaline earth metal salt of a carboxylic or thiocarboxylic acid, and mixtures thereof, and

an alkali metal carbonate, said antimony compound, metal carboxylate and carbonate components in relative amounts which together provide a synergistic stabilizing effectiveness upon said resin.

4,440,675

HUMAN IMMUNE INTERFERON

Irwin A. Braude, Burke, Va., assignor to Meloy Laboratories, Inc., Springfield, Va.

Continuation-in-part of Ser. No. 293,775, Aug. 17, 1981, Pat. No. 4,382,027. This application Oct. 29, 1982, Ser. No. 437,660
Int. Cl.³ C07G *7/00*; A61K *45/02*
U.S. Cl. 260—112 R **18 Claims**

1. A process for purifying crude human immune interferon which comprises:

(a) contacting a solution of crude interferon with Controlled Pure Glass beads for a period of time sufficient to accomplish equilibrated adsorption of the crude interferon to the beads in the presence of a neutral pH buffer, washing the glass beads having interferon adsorbed thereon with a chemically compatible buffer to remove the unbound contaminant until the optical density of the eluate at 280 nm is about 0, washing the glass beads having interferon adsorbed thereon with a neutral pH buffer solution until the optical density at 280 nm is about 0, eluting the adsorbed immune interferon from the glass beads with an ammonium sulfate solution;

(b) contacting the solution of interferon with an adsorbent selected from the group consisting of Concanavalin A-Sepharose, lentil lectin-Sepharose and pea lectin-agarose for a period of time sufficient to accomplish equilibrated adsorption of the interferon to the absorbent in the presence of a neutral pH buffer, washing the adsorbent having interferon adsorbed thereon from the soluble fraction with ammonium sulfate until the optical density of the eluate at 280 nm is about 0, washing the absorbent with a neutral pH buffer until the optical density of the eluate at 280 nm is about 0, eluting the adsorbed interferon with a buffer containing a member of the group consistng of alpha-methyl D-mannoside and 1-methyl D-glucoside;

(c) contacting the interferon with a member selected from the group consisting of Heparin-Sepharose or Procian Red-agarose for a period of time sufficient to accomplish equilibrated adsorption of the interferon to the member equilibrated in a neutral pH buffered solution, washing the member containing adsorbed interferon thereon with first a neutral pH buffered solution containing a sugar selected from the group consisting of alpha-methyl D-mannoside and 1-methyl D-glucoside to remove the unbound material until the optical density of the eluate at 280 nm is about 0, washing with a neutral pH buffered solution until the optical density is about 0 to remove the bound material eluting the adsorbed interferon with a second neutral pH buffered solution containing a highly concentrated salt;

(d) dialyzing the partially purified interferon against a chemically compatible buffer and contacting the solution of dialyzed partially pure interferon with a column of cationic exchanger resin for a period of time sufficient to accomplish equilibrated adsorption of the interferon to the exchanger in the presence of a buffer at pH about 9.0 to 10.0, washing the resin having interferon adsorbed thereon from the soluble fraction with a buffered solution until the optical density of the eluate at 280 nm is about 0, eluting the adsorbed interferon with a desorbing buffer of 20 mM tris-HCl at pH 9.0–10.0 containing 50 mM NaCl; and

(e) further purifying by subjecting the elution fraction to gel-filtration treatment equilibrated in a neutral pH buffered solution containing a highly concentrated salt, and eluting whereby the solutes within the elution fractions are separated according to their molecular weights; and collecting the solute fraction containing a near homogeneous interferon preparation.

4,440,676

PROCESS FOR THE PRODUCTION OF A DIPEPTIDE, A POLYPEPTIDE OR A PROTEIN

John I. G. Cadogan, Richmond, England; Ian Gosney, and Salih Yaslak, both of Edinburgh, Scotland, assignors to The British Petroleum Company p.l.c., London, England

Filed May 25, 1982, Ser. No. 381,781
Claims priority, application United Kingdom, Dec. 24, 1981, 8138996
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R **10 Claims**

1. In a process for the production of a dipeptide, a polypeptide or a protein wherein an end amino-group is directly combined with an end carboxyl group in the presence of a coupling agent to form a peptide linkage the improvement which comprises using as the coupling agent a pentaco-ordinate spirophosphorane.

4,440,677

METHOD AND INTERMEDIATES FOR PRODUCING α-L-ASPARTYL-L-PHENYLALANINE

Hugh L. Dryden, Deerfield, and John B. Hill, Woodstock, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Jun. 20, 1983, Ser. No. 506,465
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R **7 Claims**

1. N-acetoacetyl-α-L-aspartyl-L-phenylalanine methyl ester.

2. A method for preparing α-L-aspartyl-L-phenylalanine methyl ester comprising:

(a) reacting L-aspartic acid with diketene in basic solution at −10° C. to +20° C. to form N-acetoacetyl-L-aspartic acid

(b) dehydrating N-acetoacetyl-L-aspartic acid with a dehy-

drating agent to form N-acetoacetyl-L-aspartic anhydride.

(c) reacting the resulting N-acetoacetyl-L-aspartic acid anhydride with L-phenylalanine methyl ester to form N-acetoacetyl-α-L-aspartyl-L-phenylalanine and

(d) removing the N-acetoacetyl group from N-acetoacetyl-α-L-aspartyl-L-phenylalanine by reaction with hydroxylamine salt.

4,440,678

TRIPEPTIDE DERIVATIVES AND THEIR APPLICATION IN ASSAYING ENZYMES

Lars G. Svendsen, Reinach, Switzerland, assignor to Pentapharm, A.G., Basel, Switzerland

PCT No. PCT/CH81/00014, § 371 Date Sep. 16, 1981, § 102(e) Date Sep. 16, 1981, PCT Pub. No. WO81/02294, PCT Pub. Date Aug. 20, 1981

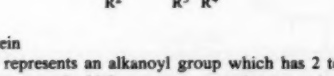
PCT Filed Feb. 6, 1981, Ser. No. 302,420

Claims priority, application Switzerland, Feb. 12, 1980, 1130/80

Int. Cl.³ C07C *103/52*; C12Q *1/56*

U.S. Cl. 260—112.5 R 5 Claims

1. Tripeptide derivatives having the formula



I

wherein

R^1 represents an alkanoyl group which has 2 to 8 carbon atoms and which may carry an amino group in the ω-position, a phenylalkanoyl group which has 2 to 4 carbon atoms in the alkanoyl and the phenyl radical of which may be substituted with an amino group in the p-position, a cyclohexylcarbonyl group which may be substituted with an aminomethyl radical in the 4-position, a benzoyl group which may be substituted with methyl, amino or halogen in the o- or p-position, an alkoxycarbonyl group having 1 to 8 carbon atoms in the alkoxy group, a benzyloxycarbonyl group which may be substituted with methoxy, methyl or chlorine in the p-position, an alkanesulfonyl group having 1 to 4 carbon atoms, a phenylsulfonyl group which may be methylated in the p-position or an α- or β-naphthylsulfonyl group,

R^2 represents a straight-chained or branched alkyl radical having 1 to 6 carbon atoms, a hydroxyalkyl radical having 1 to 2 carbon atoms, an alkoxyalkyl radical having 1 to 2 carbon atoms in the alkyl and 1 to 4 carbon atoms in the alkoxy, a benzyloxyalkyl radical having 1 to 2 carbon atoms in the alkyl, an ω-carboxyalkyl or ω-alkoxycarbonylalkyl radical which has 1 to 3 carbon atoms in the alkyl and the alkoxy group of which is straight-chained or branched and has 1 to 4 carbon atoms, or an ω-benzyloxycarbonyl-alkyl radical having 1 to 3 carbon atoms in the alkyl, or a cyclohexyl-, cyclohexylmethyl-, 4-hydroxycyclohexylmethyl-, phenyl-, benzyl-, 4-hydroxybenzyl- or imidazol-4-yl-methyl radical, except that when R^2 is isopropyl or cyclohexyl, R' cannot be benzyloxycarbonyl,

R^3 represents hydrogen or a straight-chained or branched alkyl radical having 1 to 4 carbon atoms,

R^4 represents hydrogen or a methyl or ethyl radical, and

R^5 represents an amino group which is substituted with aromatic or heterocyclic radicals and which is capable of being split off hydrolytically with formation of a coloured or fluorescent compound $H-R^5$, and salts thereof with acids.

4,440,679

PASTEURIZED THERAPEUTICALLY ACTIVE PROTEIN COMPOSITIONS

Peter M. Fernandes, Concord, and John L. Lundblad, El Cerrito, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Continuation of Ser. No. 127,351, Mar. 5, 1980, abandoned. This application Dec. 20, 1982, Ser. No. 451,645

Int. Cl.³ A61K *35/16, 37/02, 37/06*; C07G *7/00*

U.S. Cl. 260—122 25 Claims

1. A method of pasteurizing a composition comprising a thermally sensitive, therapeutically active protein selected from the group consisting of antihemophilic factor (Factor VIII), fibronectin, plasminogen, antithrombin III, fibrinogen, alpha-1-antitrypsin, and prekallikrein, which comprises:

(a) mixing the protein composition with a compound selected from the group consisting of sugars and reduced sugars in an aqueous medium said compound being present in the mixture in an amount of about 30% to saturation, on a weight to volume basis, and

(b) heating the mixture at a temperature of about 60°–75° C. and a pH of about 5.5–8.0 for a time sufficient to pasteurize the protein composition and render it substantially free of infective hepatitis.

23. A method for pasteurizing a composition containing a thermally sensitive, therapeutically active protein selected from the group consisting of antihemophilic factor (Factor VIII), fibronectin, plasminogen, albumin, an immune serum globulin, a modified immune serum globulin, antithrombin III, Plasma Protein Fraction (human), fibrinogen, alpha-1-antitrypsin, human blood plasma, partially fractionated human blood plasma and prekallikrein, which comprises:

(a) mixing the protein composition with an aqueous medium containing a heat stabilizing compound consisting essentially of non-heat treated sugars and reduced sugars, said compound being present in the mixture in an amount of about 30% to saturation, on a weight to volume basis and

(b) heating the mixture at a temperature of about 60°–75° C. and a pH of about 5.5–8.0 for a time sufficient to pasteurize the protein composition and render it substantially free of infective hepatitis.

4,440,680

MACROMOLECULAR BIOLOGICALLY ACTIVE COLLAGEN ARTICLES

Gheorghe Cioca, Belleville, N.J., assignor to Seton Company, Newark, N.J.

Division of Ser. No. 190,372, Sep. 24, 1980, Pat. No. 4,374,121, which is a continuation-in-part of Ser. No. 74,738, Sep. 12, 1979, Pat. No. 4,279,812. This application Jan. 4, 1982, Ser. No. 336,835

Int. Cl.³ C07G *7/00*

U.S. Cl. 260—123.7 2 Claims

1. A regenerated collagen product having an average molecular weight of 383,000 to 460,000 with 4% to 6% of the polypeptide chains having a molecular weight of 30,000 to 60,000 and 8% to 12% of the polypeptide chains having a molecular weight of 1,000,000 to 1,500,000, said collagen product having an axial periodicity between triple helix fibrils of about 750 Å to 850 Å.

4,440,681

WATER-INSOLUBLE MONOAZO DYESTUFFS AND THEIR PREPARATION

Horst Tappe, Dietzenbach; Rudolf Löwenfeld, Dreieich; Uwe Kosubek, Büttelborn, and Maria Kallay, Königstein, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

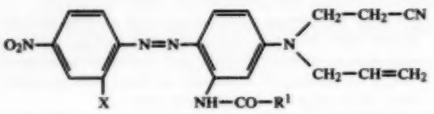
Filed Apr. 24, 1981, Ser. No. 257,360

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1980, 3016301

Int. Cl.³ C09B 29/08

U.S. Cl. 260—207.1 2 Claims

1. Water-insoluble azo dyestuffs of the formula



wherein X is hydrogen, chloro, bromo, cyano or nitro and R^1 is methyl or ethyl.

4,440,682

STEREOSPECIFIC SYNTHESIS OF ISOCEPHALOSPORINS AND 2-OXA ISOCEPHALOSPORINS

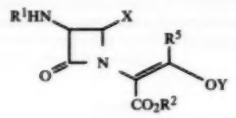
Ajay K. Bose, Mountain Lakes, N.J.; Isabel F. Fernandez, Madrid, Spain, and Kanti J. Gala, Harrison, N.J., assignors to Laboratorio Farmaceutico Quimico "LaFarquim, S.A.", Madrid, Spain

Filed Apr. 6, 1981, Ser. No. 251,128

Int. Cl.³ C07D 205/08, 498/04, 497/04, 403/12

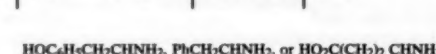
U.S. Cl. 260—239 A 6 Claims

1. A racemic or enantiomeric cis-3,4-azetidinone of formula VI or an unequal mixture of enantiomers thereof



wherein

R^1 is an N-acyl side chain of the α-amino-β-lactam antibiotics which is selected from the group consisting of R^3CO or alpha-alkyl-β-(alkoxycarbonyl)vinyl, alpha-alkyl-beta-(alkylcarboxyl) vinyl, alpha-alkyl-beta-(alkyl)-beta-(alkoxycarbonyl) vinyl, alpha-alkyl-beta-(alkyl)-beta-(alkylcarbonyl)vinyl wherein each alkyl or alkoxy substituent of each said vinyl independently is from 1 to 3 carbons in length; R^3 being selected from (2-thienyl) methyl, (2-thienyl) methoxy, phenyl, benzyl, phenoxy, phenoxymethyl, phenylethyl, phenoxyethyl, the monosubstituted froms of said phenyl containing groups wherein the substituent is halogen, amino, carboxyl, carboxyester of 2 to 7 carbons, carboxamido, N-alkylcarboxamido of 1 to 4 carbons in the alkyl group



R^2 is hydrogen, benzyl, p-nitrobenzyl, phenyl, p-biphenyl or alkyl of 1 to 3 carbon atoms;

R^5 is hydrogen, alkyl of 1 to 3 carbons, phenyl, furyl, thienyl, acetoxymethyl or S-(N-methyltetrazol-1-yl) thiomethyl;

X is hydroxy, methanesulfonoxy, p-toluenesulfonoxy, trifluoromethanesulfonoxy, alkylcarbonato of 2 to 4 carbons, benzylcarbonato, chloro, bromo or iodo, and;

Y is methanesulfonyl, p-toluenesulfonyl, trifluoromethanesulfonyl, alkoxycarbonyl of 2 to 4 carbons or benzyloxycarbonyl.

4,440,683

CYCLIZATION TO FORM CEPHEM RING AND AZETIDINONE INTERMEDIATES THEREFOR

Teruji Tsuji, Osaka; Yoshio Hahashima, Kyoto; Mitsuru Yoshioka, Osaka; Masayuki Narisada, Osaka; Hiroshi Tanida, Osaka; Taichiro Komeno, Osaka, and Wataru Nagata, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

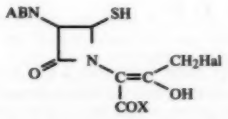
Division of Ser. No. 125,232, Feb. 27, 1980, Pat. No. 4,332,722, which is a division of Ser. No. 66,462, Aug. 13, 1979, abandoned, which is a contiuuation of Ser. No. 856,807, Dec. 1, 1977, abandoned, which is a division of Ser. No. 658,665, Feb. 17, 1976, Pat. No. 4,079,181. This application Jan. 11, 1982, Ser. No. 338,651

Claims priority, application Japan, Feb. 17, 1975, 50/19612; Feb. 21, 1975, 50/22229; Mar. 7, 1975, 50/28452; Mar. 30, 1975, 50/33808

Int. Cl.³ C07D 205/08, 403/04, 401/12, 405/12

U.S. Cl. 260—239 A 6 Claims

1. A member selected from the group consisting of (a) a compound of the formula



wherein A is hydrogen, B is hydrogen or an acyl group of the following formula

Ar—CQQ—CO— or Ar—G—CQQ—CO—

wherein Ar is furyl, thienyl, pyrryl, oxazolyl, isoxazolyl, oxadiazolyl, oxatriazolyl, thiazolyl, isothiazolyl, thiadiazolyl, thiatriazolyl, pyrazolyl, imidazolyl, triazolyl, tetrazolyl, phenyl, pyridyl, pyrimidyl, pyrazinyl, pyridazinyl, triazinyl or cyclohexadienyl, each being optionally substituted by alkyl containing 1 to 3 carbon atoms, aminomethyl, hydroxy, alkoxy containing 1 to 3 carbon atoms or halogen, Q is hydrogen or methyl, and G is oxygen or sulfur or alternatively, A and B together with the nitrogen to which they are attached represent phthalimido and Hal is chlorine, bromine, iodine or fluorine, and X is OH or a carboxy protecting group containing up to 20 carbon atoms, and

(b) an oxo tautomer of said compound. pg,81

4,440,684

PROCESS FOR THE PREPARATION OF 6-METHYL-$\Delta^{4,6}$-3-KETO STEROIDS

Klaus Annen; Henry Laurent; Helmut Hofmeister, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

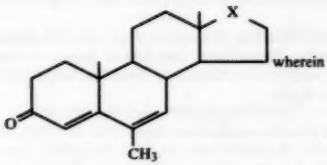
Filed Feb. 4, 1983, Ser. No. 463,702

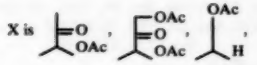
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3204281

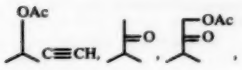
Int. Cl.³ C07J 19/00

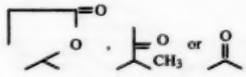
U.S. Cl. 260—239.57 23 Claims

1. A process for preparing a 6-methyl-$\Delta^{4,6}$-3-keto steroid of the formula



X is 





comprising

reacting, in a single stage, a corresponding Δ^4-3-keto steroid, in the presence of an alkali metal acetate, with methoxymethyl acetate in an inert solvent at a temperature above room temperature.

4,440,685

IMIDAZODIAZEPINES AND PROCESSES THEREFOR

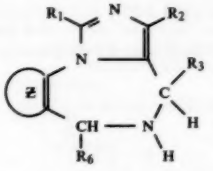
Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 243,091, Mar. 12, 1981, abandoned, which is a division of Ser. No. 905,820, May 15, 1978, Pat. No. 4,280,957, which is a continuation of Ser. No. 663,660, Mar. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 602,691, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 504,924, Sep. 11, 1974, abandoned. This application Jun. 16, 1983, Ser. No. 504,999

Int. Cl.[3] **C07D** *487/14, 487/04, 495/04;* **A61K** *31/55*

U.S. Cl. 260—245.6 **5 Claims**

1. A compound of the formula

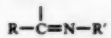


R_1 is selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl,

phenyl, C_1 to C_7 alkoxy lower alkyl, halo lower alkyl, amino lower alkyl, mono- or di- C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino lower alkyl, pyridyl benzyl and the group $R^{65}CO$ wherein R^{65} is hydrogen or lower alkyl R_2 is selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl

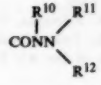
lower alkyl, C_1 to C_7 alkoxy lower alkyl, halo-lower alkyl, amino or mono- or di- C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino lower alkyl, cyano, cyano lower alkyl, mono- or di- C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino, the grooup -COOR where R is hydrogen or lower alkyl, the group

where R is hydrogen or lower alkyl, or the group



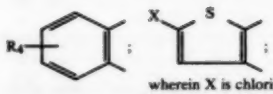
wherein R' is hydrogen, lower alkyl hydroxy, phenyl, C_1 to C_7 alkoxy, amino, mono or di-alkylamino and arylamino and R is hydrogen or lower alkyl, the group

(where R^{85}, R^{86} are hydrogen, lower alkyl, hydroxy lower alkyl, lower alkenyl, aryl or together R^{85} and R^{86} with the nitrogen atom form a part of a 5- or 6-membered heterocyclic ring selected from the group consisting of morpholino, piperazino, piperidino and pyrrolidino and the group $(CH_2)_n NR^{95}R^{96}$ where R^{95} and R^{96} are hydrogen, lower alkyl, hydroxy lower alkyl, lower alkenyl, aryl, or together R^{95} and R^{96} with the nitrogen atom form a part of a 5- or 6-membered heterocyclic ring selected from the group consisting of morpholino, piperazino, piperidino and pyrrolidino) or the group

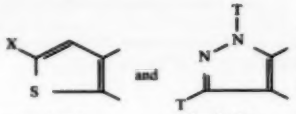


where R^{10}, R^{11}, R^{12} are hydrogen, lower alkyl or the group $(CH_2)_n NR^{13}R^{14}$ where n is 1 to 4 and R^{13}, R^{14} are hydrogen or lower alkyl with limitation that where R^{10}, R^{11} or R^{12} *is* $(CH_2)_n R^{13}R^{14}$ then the remaining substituents are hydrogen or lower alkyl; R_3 is selected from the group consisting of hydrogen or lower alkyl; R_4 is selected from the group consisting of hydrogen, halogen, cyano, trifluoromethyl, lower alkyl, mono- or di- C_1 to C_7 alkyl or phenyl or chlorphenyl or tolyl substituted amino, amino, hydroxy lower alkyl and lower alkanoyl; R^{20} is hydrogen or C_1 to C_6 alkyl; R_6 is selected from the group consisting of phenyl, mono-halo substituted phenyl, di-halo substituted phenyl, pyridyl and mono-halo or mono-nitro substituted pyridyl with the limitation that phenyl is not nitro substituted; and

is selected from the group consisting of



wherein X is chlorine, bromine, or iodine



wherein X is chlorine, bromine, or iodine

wherein T is hydrogen or lower alkyl

and the pharmaceutically acceptable salts thereof.

4,440,686

2-AZIDO-3-BENZYLOXY-PROPIONIC ACID-BENZYL ESTER, PROCESS FOR ITS PRODUCTION AND ITS USE

Franz Effenberger, Stuttgart, and Gerhard Zoller, Maintal, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,323

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135840

Int. Cl.³ C07C *117/00*

U.S. Cl. 260—34 **4 Claims**

1. 2-azido-3-benzyloxypropionic acid benzyl ester.

4,440,687

AZIDO NITRAMINO ETHERS

Edward F. Witucki, Van Nuys, and Joseph E. Flanagan, Woodland Hills, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 8, 1982, Ser. No. 366,745

Int. Cl.³ C07C *117/00*

U.S. Cl. 260—349 **2 Claims**

1. As a new compound, bis(2-azidoethoxymethyl) nitramine.

2. As a new compound, 1,12-diazido-3,10-dioxa-5,8-dinitrazadodecane.

4,440,688

NOVEL DERIVATIVES OF URSODEOXYCHOLIC ACID

Carlo Scolastico, Vallisneri Street 13B; Cesare Sirtori, Bossi Street 1, both of Milan, Italy, and David Kritchevsky, 36 St. at Spruce, Philadelphia, Pa. 19105

Filed Jun. 28, 1982, Ser. No. 392,634

Claims priority, application Italy, Jul. 24, 1981, 23108 A/81

Int. Cl.³ C07J *13/00*

U.S. Cl. 260—397.1 **1 Claim**

1. The compound 7-oleyl-ursodeoxycholic acid.

4,440,689

ACYLOXYSTEROIDS AND PROCESS FOR PRODUCING SAME

Issei Nitta, Machida; Shinichiro Fujimori, Yokohama; Toshio Haruyama, Sagamihara, and Shinya Inoue, Yamato, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,447

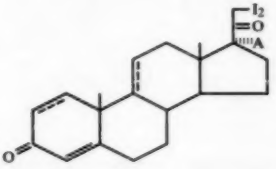
Claims priority, application Japan, Jul. 22, 1981, 56-114867; Jul. 22, 1981, 56-114868; Jul. 23, 1981, 56-115691; Jul. 28, 1981, 56-118340; Jul. 28, 1981, 56-118341; Jul. 28, 1981, 56-118342; Jul. 28, 1981, 56-118344; Jul. 29, 1981, 56-118710; Aug. 26, 1981, 56-133843; Aug. 27, 1981, 56-134768

Int. Cl.³ C07J *9/00*

U.S. Cl. 260—397.4 **10 Claims**

1. A diiodosteroid of formula (Ia):

(Ia)



wherein the dotted lines in the rings independently represent a single or double bond and A represents an acyloxy group.

4,440,690

PROCESS FOR THE SYNTHESIS OF 6-BROMO-17,21-DIHYDROXY 3,11,20-TRIOXO-1,4-PREGNADIENES 17,21-DIESTERS

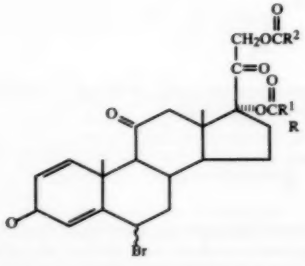
Elliot L. Shapiro, Cedar Grove, and Lawrence E. Finkenor, Wayne, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 27, 1982, Ser. No. 453,844

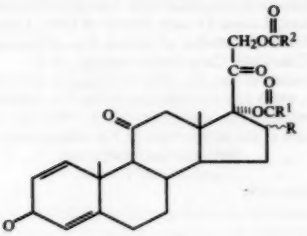
Int. Cl.³ C07J *5/00*

U.S. Cl. 260—397.45 **5 Claims**

1. A process for the selective synthesis of a compound of the formula:



wherein R is hydrogen or lower alkyl; and R^1 and R^2 are independently selected from lower alkyl; which comprises reaction of a compound of the formula



wherein R is hydrogen or lower alkyl; and R^1 and R^2 are independently selected from lower alkyl; with bromine in a solution of hydrogen bromide in acetic acid.

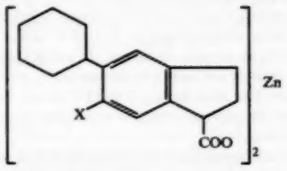
4,440,691

INDANCARBOXYLIC ACID ZINC SALTS

Seiji Kuzuna, Kawanishi; Shoji Kishimoto, Takarazuka, and Tetsuya Aono, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 15, 1982, Ser. No. 358,215
Claims priority, application Japan, Mar. 19, 1981, 56-41114
Int. Cl.³ C07F 3/06
U.S. Cl. 260—429.9 2 Claims

1. A compound of the formula:



wherein X is a halogen atom.

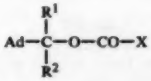
4,440,692

SUBSTITUTED CARBONIC ACID ESTERS

Hubert Kalbacher, Hefelestrasse 15, 7407 Rottenburg/Neckar, and Wolfgang Voelter, Panoramastrasse 71, 7400 Tuebingen-Hagelloch, both of Fed. Rep. of Germany

Continuation of Ser. No. 71,668, Aug. 31, 1979, abandoned. This application Apr. 28, 1982, Ser. No. 372,798
Int. Cl.³ C07C 69/96, 125/063
U.S. Cl. 260—463 7 Claims

1. Compounds having the formula:



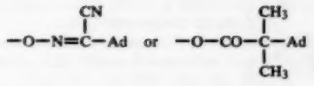
(I)

wherein,

Ad is the 1-adamantyl residue which is unsubstituted or substituted by alkyl groups of 1 to 8 carbon atoms, alkoxy groups of 1 to 8 carbon atoms, nitro groups, or halogen,

R^1 and R^2 are saturated alkyl groups of 1 to 8 carbon atoms; and

X is chlorine; fluorine; azido, phenoxy; phenoxy substituted in the benzene nucleus by fluorine, chlorine, bromine, iodine, nitro, alkoxy groups, or alkyl groups; N-oxysuccinimido; or residues having the formulae:



wherein Ad has the above-identified meaning.

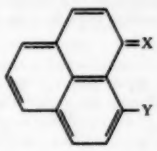
4,440,693

PREPARATION OF ELECTRICALLY CONDUCTIVE PRODUCTS

Herbert Naarmann, Wattenheim; Klaus Penzien, Frankenthal; Volker Muench, and Klaus-Dieter Franz, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,726
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047085
Int. Cl.³ C07F 00/00, 1/08, 15/02
U.S. Cl. 260—439 R 6 Claims

1. A process for the preparation of electrically conductive products which are stable to air and have conductivities greater than 1×10^{-3} S/cm, said process comprising: reacting, in solution, a cation of a metal selected from the group consisting of Mn, Tc, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd and Cu, which metal cation is employed in the form of a salt, with a 1,9-substituted phenalene of the general formula (I)



(I)

where X is O, NH, S, Se or Te and Y is OH, NH_2 or SH, as organic chelating compound to give a metal chelate; isolating said metal chelate from said solution, and then oxidizing the said metal chelate with an oxidizing agent selected from the group consisting of AsF_5, SbF_5, $SbCl_5$, chlorine, bromine, and iodine to form said electrically conductive product.

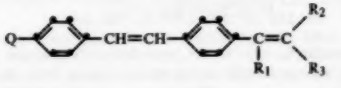
4,440,694

PROCESS FOR THE PRODUCTION OF VINYLSTILBENE COMPOUNDS

Daniel Bellus, Riehen; Hans-Ulrich Blaser, Ettingen; Guglielmo Kabas, Aesch, all of Switzerland; Dieter Reinehr, Kandern, Fed. Rep. of Germany; Alwyn Spencer, and Kurt Weber, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

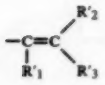
Filed May 8, 1981, Ser. No. 262,001
Claims priority, application Switzerland, May 13, 1980, 3730/80; Mar. 5, 1981, 1474/81
Int. Cl.³ C07C 121/70, 69/618, 103/24
U.S. Cl. 260—465 D 13 Claims

1. A process for the production of a vinylstilbene compound of the formula

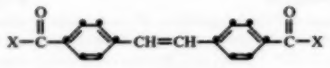


(I)

wherein Q is the grouping —COX or

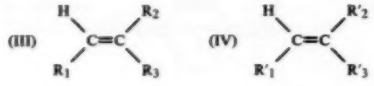


and wherein each of R_1 and R_1' independently is hydrogen, cyano, alkyl or a non-chromophoric esterified carboxyl group, each of R_2 and R_2' independently is hydrogen, alkyl or alkenyl each unsubstituted or substituted by non-chromophoric substituents, or is a non-chromophoric second order substituent, each of R_3 and R_3' independently is hydrogen, cyano, or alkyl or alkenyl each unsubstituted or substituted by non-chromophoric substituents, and X is chlorine, bromine or iodine; or R_1 together with R_3 or R_1' together with R_3' are an alkylene bridge, with the proviso that not more than one of R_2 and R_3 and not more than one of R_2' and R_3' are hydrogen, and that, if Q is —COX, R_1 and R_3 are hydrogen and R_2 is carboxylic acid (C_1–C_4)alkyl ester or cyano, which process comprises reacting 1 molar equivalent of a compound of the formula II



(II)

wherein X is as defined above, in the presence of a base and with the addition, as a catalyst, of palladium metal or a palladium compound which, under the reaction conditions, form labile palladium(O) compounds which do not contain phosphorus, with 1 molar equivalent of a compound of the formula III or with 1 molar equivalent of each of the compounds of the formulae III and IV



(III) (IV)

wherein R_1, R_2 and R_3 and R_1', R_2' and R_3' are as defined above.

4,440,695

METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

Jeffrey D. Robbins, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 12, 1982, Ser. No. 407,366

Int. Cl.³ C07F 9/38

U.S. Cl. 260—502.5 F **10 Claims**

1. A method for the production of N-phosphonomethylglycine which comprises reacting N,N-bis(phosphonomethyl)glycine, having the formula

with hydrochloric acid in the presence of water, and at a sufficient temperature and at a pressure ranging from about 3 to about 10 atmospheres sufficient to cause the formation of N-phosphono-methylglycine.

4,440,696

PROCESS FOR PRODUCING TRIARYLPHOSPHITES

Rudolf Maul, Lorsch/Hessen; Eberhard Otto, Lindenfels, and Horst Zinke, Ernsthofen, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 103,132, Dec. 13, 1979, Pat. No. 4,312,818, which is a continuation of Ser. No. 928,644, Jul. 27, 1978, abandoned. This application Oct. 1, 1981, Ser. No. 307,474

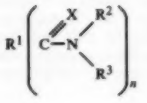
The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.

Int. Cl.³ C07F 9/141

U.S. Cl. 260—976 **6 Claims**

1. A process for producing a triaryl phosphite of the formula $(RO)_3P$, in which R represents aryl substituted by one or more straight-chain or branched-chain alkyl, cycloalkyl, aryl or aralkyl groups in the 2-, 2,4-, 2,6- or 2,4,6-positions, by reaction of a phosphorus trihalide with a hydroxy-substituted aromatic compound of the formula ROH in the presence or absence of a solvent, and in the presence of 0.005 to 10 mol %, relative to the hydroxy-substituted aromatic compound, of a catalyst selected from the group consisting of

(a) an amide of a carboxylic acid of the formula



in which, where n is 1, R^1 is phenyl, benzyl, naphthyl, cyclohexyl, cyclopentyl, pyridyl or alkyl having 1 to 13 C atoms; where n is 2, R^1 is phenylene, naphthylene, cyclohexylene or alkylene having 1 to 12 C atoms, or a direct bond; X is an oxygen atom; and R^2 and R^3 independently of one another are each a hydrogen atom, phenyl, benzyl, cyclohexyl or alkyl having 1 to 12 C atoms, or R^2 and R^3 together are alkylene which is optionally interrupted by O or S atoms;

(b) a primary, secondary or tertiary amine in which alkyl, cycloalkyl, aryl, alkaryl, aralkyl or alkaralkyl of 1 to 18 C atoms is linked to the N atom; and

(c) a saturated or unsaturated non-aromatic N-heterocyclic compound which is pyrrolidine, Δ^3-pyrroline, N-methylpyrrolidine, dihydroindole, pyrazolidine, imidazolidine, Δ^2-pyrazoline, 1-phenylpyrazolidine, oxazolidine, thiazolidine, oxazoline, triazolidine, oxadiazolidine, thiadiazolidine, piperidine, morpholine, N-methylmorpholine, quinolidine, 1,2-dihydropurine, 8-aza-bicyclo-[3.2.1]-octane, 1,5-diazabicyclo[5.4.0]-undec-5-ene, 2-methyl-Δ^2-oxazoline or 2-aminothiazole.

4,440,697

CARBURETOR

Yoshihiro Sakurai, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 282,016, Jul. 10, 1981, abandoned. This application Jan. 25, 1983, Ser. No. 460,766

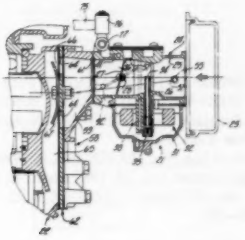
Claims priority, application Japan, Jul. 11, 1980, 55-94807; Jul. 11, 1980, 55-94804; Jul. 11, 1980, 55-94805; Jul. 11, 1980, 55-94806

Int. Cl.³ F02M 7/08

U.S. Cl. 261—34 A **8 Claims**

1. In an induction system for an internal combustion engine, a manifold having an inlet opening and outlet means offset from said inlet opening, a carburetor in registry with said inlet opening for delivering a fuel air charge thereto, and an acceler-

ating pump in said carburetor for delivering fuel upon opening of said throttle valve, the improvement comprising the dis-



charge of said accelerating pump being directed toward the center of said manifold outlet means.

4,440,698

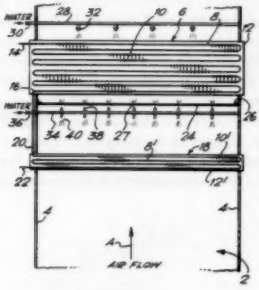
APPARATUS FOR ENSURING HEAT EXCHANGE BETWEEN A GAS FLOW AND A HEAT EXCHANGER

Ivan Bloomer, 5 Deena Close, Queens Dr., London W3 OHR, England

Continuation of Ser. No. 205,479, Nov. 10, 1980, abandoned. This application Sep. 21, 1982, Ser. No. 420,969

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—148 **12 Claims**



1. Apparatus for improving heat exchange between a gas flow and the fluid in a heat exchanger in heat transfer relation to said gas flow comprising: a duct defined by longitudinally extending duct walls, means for establishing a flow of gas through the duct, a heat exchanger comprising at least two spaced rows of fluid conduits mounted in the duct and extending transversely to said duct such that the gas flows through each of said rows, at least one spray nozzle arranged to spray liquid within the duct, and a diaphragm mounted within the duct upstream of the heat exchanger in the direction of gas flow, said diaphragm including a rigid plate extending transversely across the duct and having a plurality of perforations therein extending therethrough and defining a plurality of flow passages which extend through said diaphragm and are arranged to define constrictions for the gas flow such that jets of gas are produced, the velocity of said gas jets being sufficient to entrain and carry at least a portion of said liquid through said two rows of fluid conduits.

4,440,699

METHOD AND DEVICE FOR MOULDING A TRANSPARENT OBJECT

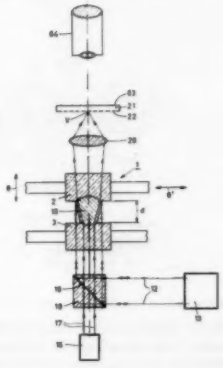
Albert Smid, and Jan Haisma, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 24, 1982, Ser. No. 381,114

Claims priority, application Netherlands, Feb. 18, 1982, 8200634

Int. Cl.³ B29D *11/00*

U.S. Cl. 264—1.4 **11 Claims**



1. A method for moulding a transparent object such as a lens or the like comprising the steps of introducing a volume of transparent materials between a pair of transparent elements configured to impart a desired shape to the material, passing a beam of radiation through said elements and the material disposed therebetween before the material has assumed its final shape so as to form a radiation spot in a plane of observation, comparing the intensity distribution of said spot formed in said observation plane with a reference distribution representative of the intensity distribution of the spot occurring when said elements assume a predetermined position relative to each other and adjusting the position of said elements relative to each other so that the intensity distribution of said spot corresponds to said reference distribution.

7. An apparatus for moulding a transparent material so as to form a transparent object of a predetermined shape such as a lens or the like, said apparatus comprising a pair of elements arranged for movement relative to each other and configured so as to impart the predetermined shape to the material disposed therebetween, means for producing an aligning beam of radiation, said elements being transparent to the radiation of said aligning beam and being arranged in the path thereof so that said aligning beam passes through said elements, means for detecting the intensity distribution in the aligning beam radiation which has passed through said elements, said intensity distribution being indicative of the position of said elements relative to each other, and means for adjusting the relative position of said elements in response to said detecting means.

4,440,700

PROCESS FOR COLLECTING CENTRIFUGALLY EJECTED FILAMENTS

Tokio Okada; Shigezo Kojima; Haruhisa Tani; Kazuhiko Kurihara, and Hiroshi Yazawa, all of Tokyo, Japan, assignors to Polymer Processing Research Institute Ltd., Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 372,190

Claims priority, application Japan, Apr. 28, 1981, 56-64854; May 26, 1981, 56-79767

Int. Cl.³ B29C *6/00*

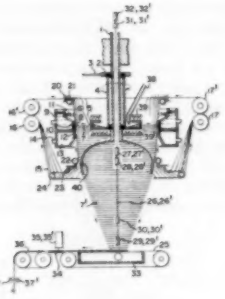
U.S. Cl. 264—8 **12 Claims**

1. In a process for producing a plurality of continuous syn-

thetic organic polymer filaments by centrifugally and horizontally ejecting liquid polymer from a plurality of nozzles of a head rotating at high velicity, the improvement which comprises obtaining a plurality of filaments of uniform thickness by

(a) establishing an annular curtain of downwardly flowing water at a spaced distance laterally outwardly from said nozzles,

(b) catching and cooling the centrifugally ejected continuous molten synthetic organic polymer filaments by impinging them against said annular curtain of downardly flowing water, and allowing said filaments to move downwardly with the downwardly flowing water in said annular curtain,



(c) separating said ejected filaments from said annular water curtain after said filaments have been cooled by said water, and

(d) collecting cooled and separated continuous filaments of synthetic organic polymers that have uniform thickness.

4,440,701

METHOD FOR FORMING VISCOUS AND PLASTICALLY DEFORMABLE FOOD MATERIAL INTO A GLOBULIN SHAPE

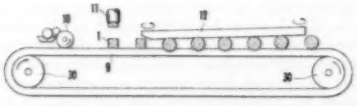
Katsumoto Ohki, Shizuoka; Tadahiko Hirokawa, Yokohama, and Hajime Sasaki, both of Kanagawa, all of Japan, assignors to Morinaga & Co., Ltd., Japan

Filed Mar. 27, 1981, Ser. No. 248,574

Claims priority, application Japan, Apr. 5, 1980, 55-44064; Jul. 21, 1980, 55-98811

Int. Cl.³ B01J *21/04*

U.S. Cl. 264—15 **14 Claims**



1. A method of forming a viscous and plastic food material into a globular shape, comprising:

feeding a viscous and plastic food material portion of a predetermined amount into the space between a pair of beds of which the surfaces, opposite to each other, have elasticity and a fibrous coating with at least one of the surfaces kept moist by an anti-sticking liquid; eccentrically rotating at least one of said beds, thus rotating and rounding the food material portion between the beds; and adjusting the space between the pair of beds to accommodate the pressure applied to the food material portion; the viscous and plastic food material being selected from the group consisting of processed rice paste food material, dough made from powdered grain, food material containing starch as its principal ingredient, food material containing fats and fatty oils mixed with a sweetener, and food material containing sugar or corn syrup.

4,440,702

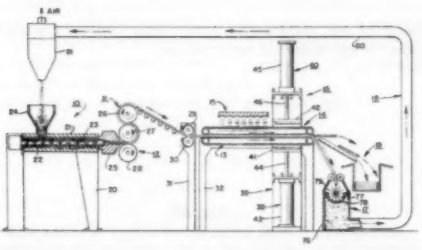
METHOD AND APPARATUS FOR MAKING THIN-WALLED PLASTIC ARTICLES

Kenneth J. Susnjara, Santa Claus, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 119,975, Feb. 8, 1980, abandoned. This application Jun. 10, 1982, Ser. No. 387,150

Int. Cl.³ B29C *1/14, 3/04, 7/00, 17/03*

U.S. Cl. 264—37 **19 Claims**



1. A method of making a thin-walled article comprising advancing a continuous web of a thermoplastic material to a forming station, intermittently positioning a heated section of said web at said forming station, advancing a female mold section at said forming station to a position adjacent a side of said web section, advancing a male mold section at said forming station on an opposite side of said web section, towards said female mold section to shear a blank from said web section, continuing the advance of said male mold section to compress the sheared blank between the surfaces of the mold sections and correspondingly form said article in said mold sections, cooling said formed article in said female mold section, retracting said male mold section, ejecting said formed article from said female mold section into the opening formed by the shearing of said web section in forming said blank, carrying the formed article away from the forming station by the movement of said web, and then separating said formed article from the web.

4,440,703

PROCESS FOR PRODUCING FOAMED AND MOLDED ARTICLE OF POLYPROPYLENE RESIN

Hiroyuki Akiyama, Hiratsuka; Kuninori Hirosawa, Isehara, and Hideki Kuwabara, Hatano, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Aug. 4, 1982, Ser. No. 405,027

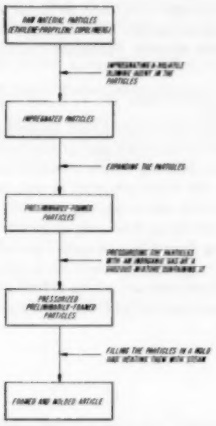
Claims priority, application Japan, Aug. 5, 1981, 56-122717

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—50 **2 Claims**

1. A process for producing a foamed and molded article of a polypropylene resin, which comprises pressurizing preliminarily-foamed particles of a non-crosslinked ethylene/-propylene copolymer having a melt index value of from 0.1 to 25, a latent heat of crystallization of not more than 28 cal/g and an ethylene content of from 1 to 30% by weight as a base resin with an inorganic gas or a gaseous mixture of the inorganic gas and a volatile blowing agent whereby the inorganic gas or the gaseous mixture penetrates into said particles and impart an elevated pressure in the range of 0.5 to 5 $kg/cm^2(G)$ to the

inside of said particles, thereafter filling said particles in a perforated mold capable of enclosing the particles but allowing



escape of gases therefrom, and then heating said particles with steam to expand them to the configuration of the mold.

4,440,704

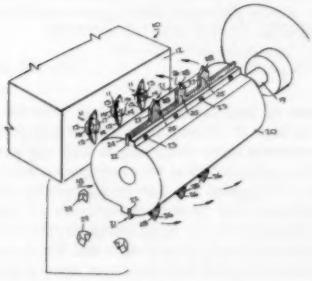
METHOD FOR MAKING EXPANDABLE FILLING ELEMENTS OF BILLOWED CONFIGURATION FOR PACKAGING

Harry Bussey, Jr., P.O. Box 115 Serpentine Rd., Navesink, N.J. 07752

Division of Ser. No. 230,113, Jan. 29, 1981, abandoned. This application Jul. 22, 1982, Ser. No. 400,719

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—51 **21 Claims**



1. A method of making expandable filling elements for packaging, said method comprising the steps of

extruding a plastified mass of thermoplastic material containing an expanding agent through an orifice having a predetermined cross-sectional shape and along a longitudinal axis;

cutting the extruded mass transversely of said axis adjacent the orifice, and along a non-linear path across the extruded mass to form a plurality of expandable cut pieces; and

cooling the cut pieces to prevent substantial expansion of the cut pieces.

4,440,705

PROCESS FOR THE PREPARATION OF CELLULAR AND NON-CELLULAR POLYURETHANE ELASTOMERS

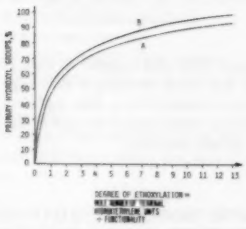
Dietmar Nissen; Wolfgang Straehle, both of Heidelberg, and Matthias Marx, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,460

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1981, 3126517

Int. Cl.³ C08G *18/14, 18/48*

U.S. Cl. 264—53 **3 Claims**



1. A process for the preparation of cellular or non-cellular polyurethane elastomers by reacting organic polyisocyanates, polyether polyols, chain extenders and/or cross-linking agents in the presence of catalysts as well as blowing agents, auxiliaries and additives, wherein polyoxyalkylene polyether polyols with terminal hydroxyethylene groups are used as the polyether polyols said polyether polyols prepared by reacting initiator compounds having molecular weights of 18 to 342 and containing from 2 to 8 Zerewitinoff active hydrogen atoms in the presence of alkaline catalysts selected from the group consisting of alkali metal alkoxides, alkali metal hydroxides and alkaline earth metal hydroxides comprising

(a) initially reacting alkylene oxides containing more than 2 carbon atoms in the presence of from 0.01 to 0.25 mole of said catalyst per equivalent of said initiator compound,

(b) further reacting the alkylene oxides containing more than 2 carbon atoms in the presence of from 0.10 to 1.0 mole of said catalyst per equivalent of said initiator compound,

(c) further reacting the alkylene oxide adduct of step (b) with ethylene oxide at a maximum concentration of 30 weight percent based on the weight of the crude polyether polyol, and

(d) removing the alkaline catalyst.

3. The process of claim **1**, wherein the components for the manufacture of the cellular and non-cellular polyurethane elastomers are prepared in accordance with the reaction molding technique.

4,440,706

ISOSTATIC MOLDING OF TWO-TERMINAL CERAMIC INSULATOR

James S. Hoffman, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1981, Ser. No. 271,508

Int. Cl.³ C04B *37/00*

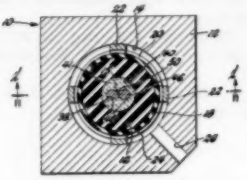
U.S. Cl. 264—56 **3 Claims**

1. A method for manufacturing a ceramic electrical insulator body adapted to receive and electrically isolate two parallel conductive rods, said method comprising

compacting ceramic powder by directing isostatic pressure radially towards an axis to press said powder about an axial core and to thereby form a self-sustaining body defining a bore derived from said core, said bore comprising parallel enlarged channels derived from axially parallel core sections that are longitudinally connected to maintain the core sections in a desired parallel relationship

despite the radial compaction pressure, whereupon the connection forms an opening between channels, and

firing the compact body to form a dense insulator body having channels derived from the enlarged bore channels



in the compact body and adapted to each receive a conductive rod, said firing resulting in shrinkage of the channel-connecting opening to a size sufficient to prevent contact between rods received in each channel to thereby electrically isolate the rods.

4,440,707

PROCESS FOR PRODUCING SILICON NITRIDE SINTERED PRODUCTS HAVING HIGH TOUGHNESS

Toru Shimamori; Yoshinori Hattori, and Yasushi Matsuo, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Sep. 29, 1982, Ser. No. 428,507
Claims priority, application Japan, Sep. 30, 1981, 56-155453
Int. Cl.³ C04B *35/38*
U.S. Cl. 264—65 **2 Claims**

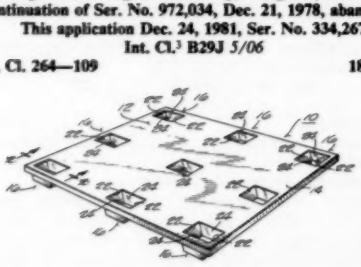
1. A process for producing a silicon nitride sintered product having high toughness comprising blending from 97 to 57% by weight of metallic silicon powder having a maximum particle size of 25 μm or less with from 1 to 15% by weight, calculated as TiN, of a TiN powder having a maximum particle size of 20 μm or less or a powder of titanium component capable of changing into TiN during reaction sintering, and from 2 to 28% by weight of one or more components selected from the group consisting of AlN, Al_2O_3, SiO_2 and oxides of rare earth elements, molding the resulting mixture, carrying out reaction sintering in a nonoxidizing atmosphere of a nitrogen gas or a nitrogen-containing mixed gas, and thereafter resintering in the same atmosphere at a temperature of from 1,600° to 2,200° C.

4,440,708

METHOD FOR MOLDING ARTICLES HAVING NON-PLANAR PORTIONS FROM MATTED WOOD FLAKES

Bruce A. Haataja, Lake Linden; Tauno B. Kipela, Atlantic Mine; Anders E. Lund, and James F. Hamilton, both of Houghton, all of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Continuation of Ser. No. 972,034, Dec. 21, 1978, abandoned. This application Dec. 24, 1981, Ser. No. 334,267
Int. Cl.³ B29J *5/06*
U.S. Cl. 264—109 **18 Claims**



1. A method for molding an article having a major plane and at least one non-planar portion displaced from the major plane, said method including the steps of:

(a) providing flake-like wood particles having an average length of about 1¼ inch to about 6 inches, an average thickness of about 0.005 to about 0.075 inch, and an average width of about 3 inches or less and no greater than the length;

(b) admixing a resinous particle board binder with the wood particles;

(c) depositing a loosely-felted, layered mat formed from said mixture on one open part of a mold including two separable parts defining a mold chamber having the shape of the article, the wood particles in each layer of the mat lying substantially flat in a place generally parallel to the major plane and being randomly oriented; and

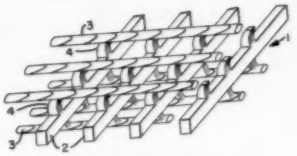
(d) closing the mold and applying sufficient heat and pressure on said mat to compress it into substantially the desired shape and size of the article and to bond the wood particles together to form a unitary structure.

4,440,709

METHOD OF MANUFACTURING RETICULAR SHEET

Ole-Bendt Rasmussen, 7 Topstykked, 3460 Burkerod, Denmark

Continuation of Ser. No. 134,551, Mar. 27, 1980, abandoned, which is a continuation of Ser. No. 928,457, Jul. 27, 1978, abandoned, which is a continuation of Ser. No. 681,531, Apr. 29, 1976, abandoned. This application Apr. 26, 1982, Ser. No. 372,034
Int. Cl.³ B29C *17/10*
U.S. Cl. 264—145 **28 Claims**

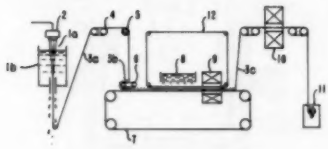


1. A method of manufacturing a unitary reticular sheet, comprising the steps of forming from at least one polymeric material, a composite sheet comprising at least one generally continuous film and joined to at least one side surface of said film an array of elongated ribs having a generally common lengthwise direction and projecting exteriorly of said film surface, said film and said ribs being integrally united in their solid state, and subsequently producing in said film a system of generally parallel elongated furrows spaced apart a generally uniform predetermined distance and having a generally common lengthwise direction and a depth exceeding the film thickness and extending into adjacent portions of said ribs but without completely interrupting said ribs to separate said film into a generally uniformly spaced apart array of substantially parallel filamentitious structures while said ribs remain generally intact, the lengthwise direction of said furrows criss-crossing with the lengthwise direction of said ribs, whereby said arrays are physically spaced apart at their nearest points in a direction generally perpendicular to the plane of said sheet and are connected by discrete links derived from the adjacent portion of said ribs and disposed between said arrays.

4,440,710
PROCESS FOR THE PREPARATION OF HIGH YOUNG'S MODULUS POLY-P-PHENYLENE-TEREPHTHALAMIDE

Takashi Fujiwara, Miyazaki; Shuji Kajita, Takatsuki; Tetsuo Matsushita, Miyazaki, and Seiichi Manabe, Ibaraki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 129,404, Mar. 11, 1980, Pat. No. 4,374,978.
This application Aug. 6, 1982, Ser. No. 406,043
Claims priority, application Japan, Mar. 13, 1979, 54-29115
Int. Cl.³ D01D 5/12
U.S. Cl. 264—184 10 Claims



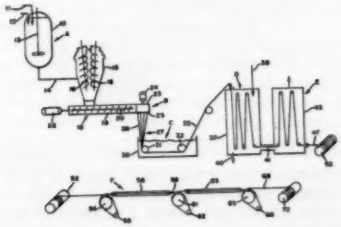
1. A process for the preparation of fibers, filament, and yarn consisting essentially of poly-p-phenylene-terephthalamide and having improved bending fatigue resistance life, which comprises extruding an anisotropic dope of a polymer consisting essentially of poly-p-phenylene-terephthalamide in concentrated sulfuric acid having a concentration of at least 98% by weight in a non-coagulating layer, passing the extrudate through a coagulating layer, depositing the resulting coagulated fibers on a net conveyor, in the absence of substantial tension washing the fibers to remove sulfuric acid and drying the fibers, releasing the fibers from the tension-free state, and heating the fibers under a tension of 1 to 15 g/d at a temperature of 250° C. to 450° C. for such a time as satisfies the requirement:

$250 \leqq (\text{temperature, °C.}) \times (\text{time, seconds})\ 0.08 \leqq 550$.

4,440,711
METHOD OF PREPARING HIGH STRENGTH AND MODULUS POLYVINYL ALCOHOL FIBERS

Young D. Kwon, Morristown; Sheldon Kavesh, Whippany, and Dusan C. Prevorsek, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 30, 1982, Ser. No. 432,044
Int. Cl.³ D01F 6/14
U.S. Cl. 264—185 24 Claims



1. A process comprising the steps:

(a) forming a solution of a linear polyvinyl alcohol having a weight average molecular weight at least 500,000 in a first solvent at a first concentration between about 2 and about 15 weight percent polyvinyl alcohol,

(b) extruding said solution through an aperture, said solution being at a temperature no less than a first temperature upstream of the aperature and being substantially at the first concentration both upstream and downstream of said aperture,

(c) cooling the solution adjacent to and downstream of the aperture to a second temperature below the temperature at which a rubbery gel is formed, forming a gel containing first solvent of substantially indefinite length,

(d) extracting the gel containing first solvent with a second, volatile solvent for a sufficient contact time to form a fibrous structure containing second solvent, which gel is substantially free of first solvent and is of substantially indefinite length;

(e) drying the fibrous structure containing second solvent to form a xerogel of substantially indefinite length free of first and second solvent; and

(f) stretching at least one of:

(i) the gel containing the first solvent,

(ii) the fibrous structure containing the second solvent and,

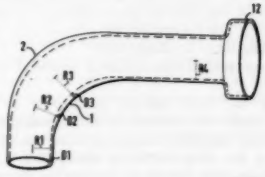
(iii) the xerogel,

at a total stretch ratio sufficient to achieve a tenacity of at least about 10 g/denier and a modulus of at least about 200 g/denier.

4,440,712
PROCESS FOR THE PREPARATION OF SHAPED ARTICLES

Friedrich Imgram, Am Frankfurter Weg 2, D 6056 Heusenstamm, Fed. Rep. of Germany

Filed Jan. 26, 1982, Ser. No. 342,759
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1981, 3102475
Int. Cl.³ B29C 27/20
U.S. Cl. 264—209.5 13 Claims



1. A process for the preparation of shaped articles from crosslinkable synthetic plastic materials comprising:

molding a crosslinkable synthetic plastic material into a first configuration;

crosslinking said crosslinkable synthetic plastic material at a temperature in excess of the crystalline melting point of said material;

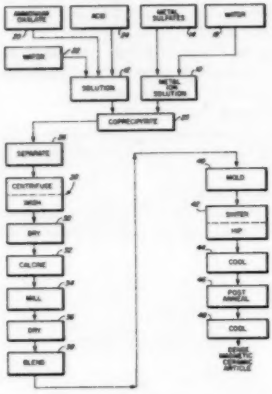
working said crosslinked first configuration into a second configuration having a predetermined relationship to said first configuration;

subjecting specific areas of said second configuration to a localized heat treatment to obtain a deformation in said specific areas of said second configuration without a return to said first configuration of said article, wherein the magnitude of deformation of the final configuration is between the magnitude of deformation of said first configuration and the magnitude of deformation of said second configuration.

4,440,713
PROCESS FOR MAKING FINE MAGNETIC FERRITE POWDER AND DENSE FERRITE BLOCKS

Eugene B. Rigby, Tucson, Ariz., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,645
Int. Cl.³ C01G 49/00; C04B 33/32
U.S. Cl. 264—325 18 Claims



1. A wet process for producing a ferrite powder comprising the steps of:

forming an aqueous metal ion sulfate solution of ferrous and zinc ions and divalent ions of one other metal in which the divalent metal ion of said one other metal is selected from the group consisting of Mn and Ni;

heating said formed metal ion solution to approximately 50° C. or less;

providing a solution containing ammonium oxalate;

heating said ammonium oxalate solution to approximately 70° C.;

reacting said metal ion solution with said ammonium oxalate solution by adding the ammonium oxalate solution into the metal ion solution to co-precipitate metal oxalates;

controlling the co-precipitate solution to have a pH from between three to about four;

separating said co-precipitated material from the liquid phase;

washing the metal oxalate precipitate to remove excess ammonium oxalate and the acid contaminants;

drying said separated co-precipitated material;

calcining the co-precipitated material in a temperature of approximately 200° C. to convert the ferrous ions to ferric ions; and

milling said calcined ferric material to form a fine powder.

4,440,714
INERTIAL CONFINEMENT FUSION METHOD PRODUCING LINE SOURCE RADIATION FLUENCE

Ronald P. Rose, Peters Township, Washington County, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 29, 1981, Ser. No. 229,357
Int. Cl.³ G21B 1/00
U.S. Cl. 376—104 2 Claims

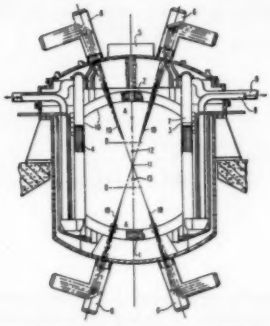
1. A method for extracting useful radiation in a controlled manner from target pellets imploded by an energy beam in an inertial confinement fusion reactor such that components of said reactor are subjected to an approximately linear source radiation fluence, which comprises

(A) injecting a first target pellet into the reactor causing said pellet to follow a trajectory which is a linear path;

(B) directing an energy beam at a first site along said linear path timed to intersect and strike said pellet thereby inducing fusion through inertial confinement;

(C) injecting a second target pellet into the reactor along said linear path;

(D) directing said energy beam at a second site along said linear path, said second site being displaced from said first site by a first distance in one dimension along said linear path, said energy beam timed to intersect and introduce



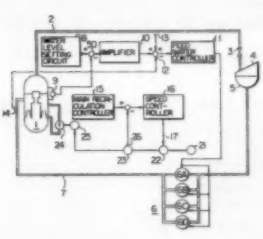
inertial confinement fusion in said second pellet at said second site;

(E) repeating the above steps C and D with third, fourth and subsequent pellets and third, fourth and subsequent sites, and second, third, and subsequent distances such that all fusion events occur along a line being said linear path and reactor components are exposed to an approximately linear source radiation fluence.

4,440,715
METHOD OF CONTROLLING NUCLEAR POWER PLANT

Takao Sato, Ibaraki; Tetsuo Ito, and Setsuo Arita, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 2, 1980, Ser. No. 192,993
Claims priority, application Japan, Oct. 5, 1979, 54-128357
Int. Cl.³ G21C 7/00
U.S. Cl. 376—210 7 Claims



4. A method of controlling an output of a nuclear power plant including a boiling water reactor having first and second coolant loops, a water feed pipe system in the first loop connected to the reactor and having a plurality of water feed pumps for feeding water into the reactor, a steam pipe system connected to the reactor for feeding steam produced by the reactor from the reactor, and a recirculating control system in the second loop for controlling a recirculating water flow rate in the second loop of the reactor to thereby control the flow rate of steam produced in the first loop by the reactor, the method comprising the step of controlling the recirculating water flow rate in response to the tripping of at least one of the plurality of water feed pumps, the recirculating water flow

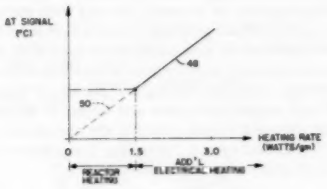
rate being controlled for a predetermined period of time so as to cause the flow rate of steam produced by the reactor to be less than the flow rate of the feed water supplied to the reactor.

4,440,716

IN-SITU CALIBRATION OF LOCAL POWER MEASURING DEVICES FOR NUCLEAR REACTORS

Robert D. Smith, Bethesda, Md., assignor to Scandpower, Inc., Bethesda, Md.

Filed Jan. 30, 1981, Ser. No. 230,027
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—247 **16 Claims**



10. In a method of in-situ calibration of a local power monitoring unit installed within a radioactive environment, having an elongated heat conductive body adapted to be heated by gamma radiation and a thermocouple device mounted in the body from which a differential temperature signal output is obtained as a result of directional changes in heat flux paths within the body, the steps of: electrically heating the body internally thereof from a current source externally of said radioactive environment during a calibration period; varying the current during said calibration period to control said internal heating of the body; monitoring changes in the signal output of the thermocouple device during the calibration period; and analyzing said changes in the signal output to determine a sensitivity function for the power monitoring unit during said internal heating of the body.

4,440,717

HEATED JUNCTION THERMOCOUPLE LEVEL MEASUREMENT APPARATUS

Frank Bevilacqua, Windsor, and Joseph M. Burger, Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 1, 1981, Ser. No. 298,436
Int. Cl.³ G21C *17/00*; G01F *23/72*
U.S. Cl. 376—247 **9 Claims**

1. An apparatus for sensing the level of a liquid contained within a pressure vessel comprising:

a. a plurality of axially spaced elongated heat conductive housings, each of said housings having

(1) a sensing portion located within said pressure vessel,

(2) a heating element located within said sensing portion of said housing having an active length at least coextensive with the range of level to be sensed by said housing,

(3) thermally conductive, electrically insulating means filling said housing at least through said active length of said heater,

(4) a first thermocouple junction, said first thermocouple junction located within said sensing portion of said housing at a location that the heat flux from said heating element at said first thermocouple junction has a substantial effect on said first thermocouple,

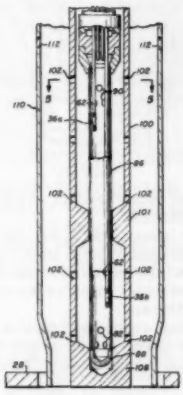
(5) a second thermocouple junction, said second thermocouple junction electrically and serially connected to said first thermocouple junction, said second thermocouple junction located within said sensing portion of said housing at a location sufficiently remote from said heating element that the heat flux from said heating element at said second thermocouple junction has substantially no effect on said second thermocouple junction,

(6) a splash guard enclosing a volume, having an exterior and means for fluid communication between the volume enclosed by said splash guard and the exterior of said splash guard said splash guard enclosing a portion of said housing over at least the active length of said heating element;

b. means for supplying energy to each of said heating elements;

c. means for measuring the net voltage generated by each of said first thermocouple junctions and said second thermocouple junctions;

d. a first tubular element having an interior, an exterior, an enclosed lower end, and means for fluid communication between said interior and said exterior said first tubular element surrounding said plurality of axially spaced elongated heat conductive housings and extending substantially the length of said housings, whereby liquid or liquid flashing to gas within said first tubular element exits through said fluid communicating means upon a pressure reduction or change in fluid level in said pressure vessel thereby maintaining equalized liquid levels on said interior and exterior of said first tubular element,



e. a second tubular element having an interior, an exterior, and means for fluid communication between said interior and said exterior, said second tubular element surrounding said first tubular element, and extending substantially the length of said first tubular element; and

f. at least a portion of said fluid communicating means between said interior and said exterior of said second tubular element are axially offset from said fluid communicating means between said interior and said exterior of said first tubular element.

4,440,718

FUEL ASSEMBLY TRANSFER DEVICE FOR BREEDER NUCLEAR REACTOR

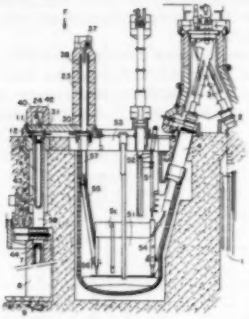
Andre Plagnard, Montrouge, France, assignor to Novatome, Le Plessis, France

Filed Aug. 10, 1981, Ser. No. 291,679
Claims priority, application France, Sep. 22, 1980, 80 20344
Int. Cl.³ G21C *19/22*
U.S. Cl. 376—269 **4 Claims**

1. A device for the transfer of fuel assemblies for a breeder nuclear reactor between a storage position external and adjacent to the reactor vessel and a position for evacuation and introduction from which the evacuation of irradiated assemblies and the supplying of the reactor with new assemblies is effected, comprising

(a) a support adapted to rest on the structure of said reactor laterally of said reactor vessel above two access shafts formed in said structure vertically in line with said storage position and with said position for evacuation, respectively, said support being fixed on said structure by means of dismountable fixing devices;

(b) a platform mounted horizontally and movable in rotation about a vertical axis on said support with the interposition of a sealing joint and pierced by at least one aparture situated so as to be brought in concordance successively



with the upper parts of each of said access shafts by rotation of said platform;

(c) at least one hopper able to contain a fuel assembly in vertical position and disposed on the upper surface of said platform round the aperture formed therein, said hopper being equipped with a winch for the vertical displacement of said assembly; and

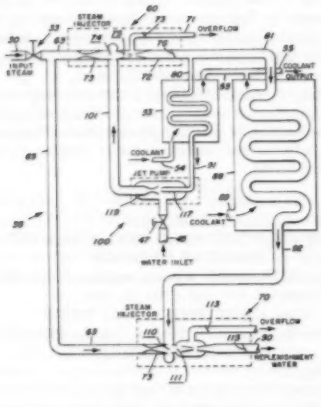
(d) corresponding connecting devices, disposed, respectively, on the lower surface of said platform round the aperture and on the upper parts of the access shafts.

4,440,719

STEAM DRIVEN WATER INJECTION

Robert W. Howard, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Oct. 13, 1981, Ser. No. 310,928
Int. Cl.³ G21C *15/00*; F04F *5/22*
U.S. Cl. 376—372 **2 Claims**



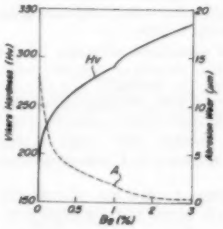
1. In a nuclear system including a pressure vessel containing a nuclear reactor core for generating steam, an injection system for supplying water through a return pipe of the pressure vessel, said injection system comprising first and second steam-driven water injectors for driving water, each of them including an inlet and an output for water and effective for raising water pressure between inlet and output; first pipe means for applying steam from said vessel to said first injector; second pipe means for connecting the output of said first injector to the inlet of the second injector, the output of said second injector being effective for feeding water into said return pipe of the pressure vessel; first cooling means for cooling water passing through said second pipe means, said first cooling means being in thermal communication with said second pipe means; jet pump means for receiving input water from a source of water and effective for directing it to the inlet of said first injector, said second pipe means including a branch effective for diverting a portion of the water flowing from the output of said first injector to said jet pump means wherein said portion of water is effective for entraining water from said source of water for introduction into the inlet of said first injector; and second cooling means for cooling said portion of water in the branch of said second pipe means and subject to thermal communication with said branch, whereby the operational capability of said injection system for raising the pressure level of water in said return pipe is increased.

4,440,720

MAGNET ALLOY USEFUL FOR A MAGNETIC RECORDING AND REPRODUCING HEAD AND A METHOD OF MANUFACTURING THEREOF

Hakaru Masumoto, Sendai, and Yuetsu Murakami, Izumi, both of Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Sendai, Japan

Filed Sep. 9, 1981, Ser. No. 300,586
Claims priority, application Japan, Dec. 16, 1980, 55-177682
Int. Cl.³ C22C *19/03*
U.S. Cl. 420—459 **8 Claims**



1. A magnet alloy useful for a magnetic recording and reproducing head consisting of by weight 70 to 86% of nickel, more than 1% and less than 14% of niobium, 0.001 to 3% of beryllium, the remainder of iron and a small amount of impurities, said magnet alloy having initial permeability of more than 3,000, maximum permeability of more than 5,000, and Vickers hardness of more than 130.

4,440,721

AQUEOUS LIQUIDS CONTAINING METAL CAVITATION-EROSION CORROSION INHIBITORS

Joe C. Wilson, Woodhaven; Stanley T. Hirozawa, Birmingham, and John J. Conville, Canton, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation of Ser. No. 315,319, Oct. 26, 1981, abandoned. This application Feb. 11, 1983, Ser. No. 465,889
Int. Cl.³ C23F *11/04, 11/18*; C02F *5/10*
U.S. Cl. 422—16 **18 Claims**

12. A process for inhibitng mineral scale and corrosion of metal in the presence of aqueous liquids and especially for inhibiting cavitation-erosion corrosion of aluminum compris-

ing adding to said aqueous liquid the following parts based upon 100 parts by weight of said aqueous liquid from about:

(A) 0.5 to 2 parts by weight of a water-soluble hydrogen phosphate,

(B) 0.001 to 0.50 parts by weight of a water-soluble molybdate, tungstate, or selenate, and

(C) a 0.1 part to 0.8 part by weight of a water-soluble silicate.

4,440,722

DEVICE FOR OXYGENATING BLOOD CIRCULATING IN AN EXTRACORPOREAL CIRCUIT WITH A HEAT EXCHANGER

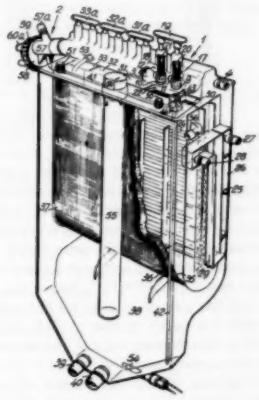
Libero Luppi, Mirandola, Italy, assignor to Dideco S.p.A., Mirandola, Italy

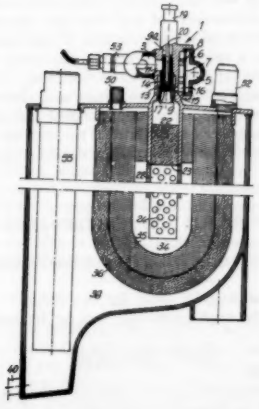
Filed Oct. 2, 1981, Ser. No. 308,322

Claims priority, application Italy, Oct. 6, 1980, 25141 A/80; Jul. 10, 1981, 22864 A/81

Int. Cl.³ A61M *1/03*

U.S. Cl. 422—46 **4 Claims**





1. A device for oxygenating blood circulating in an extracorporeal circuit, comprising a housing, a venous blood inlet manifold and an oxygen inlet manifold secured to said housing, a plurality of oxygenating modules each arranged between the interior of said manifolds and the interior of said housing, a blood and oxygen mixing chamber in said housing below said oxygenating modules and communicating therewith, a homogenizing filter in said mixing chamber, a heat exchanger in said housing below said homogenizing filter, an antifoaming filter generally surrounding said heat exchanger in said housing, an arterial blood collecting chamber in said housing, and arterial blood outlet fittings communicating with said arterial blood collecting chamber, wherein each of said oxygenating modules comprises at least one stub pipe extending substantially perpendicularly to said venous blood inlet manifold and directed into said mixing chamber, a shutter means for controlling communication between the interior of said at least one stub pipe and the interior of said venous blood inlet manifold, inclined through holes in said at least one stub pipe for providing communication between the interior of said at least one stub pipe and the interior of said oxygen inlet manifold, and wherein said shutter means comprises a plunger of elastic material slidable in contact with said at least one stub pipe inside thereof between a position in which communication of said at least one stub pipe with said manifolds is closed and a position in which the latter communication is open, and wherein plungers of stub pipes of a same oxygenating module have a common operating member operable from outside said housing for selectively operating said oxygenating modules thereby adapting the device to different blood flow rates while maintaining substantially a constant degree of oxygenation of the blood flowing through the device.

4,440,723

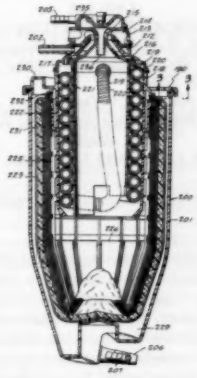
BLOOD OXYGENATOR

Lucas S. Gordon, Fountain Valley, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

Filed Jul. 10, 1981, Ser. No. 282,283

Int. Cl.³ A61M *1/03*

U.S. Cl. 422—47 **5 Claims**



1. An apparatus for oxygenating blood comprising:

a housing having an outer shell portion and a cap portion closing the upper end of said outer shell portion, said cap portion having fixedly mounted thereon:

a blood inlet means;

an oxygen-containing gas inlet means;

an excess oxygen and carbon dioxide vent means;

a wall means suspended from said cap portion and extending in a direction toward the bottom of said outer shell portion and spaced radially inwardly therefrom, said wall means defining therewithin a blood oxygenating chamber with said blood and oxygen-containing gas inlet means communicating therewith;

said wall means and said outer shell portion defining therebetween a vent chamber in communication with said blood oxygenating chamber;

said excess oxygen and carbon dioxide vent means communicating with said vent chamber;

an oxygenated blood outlet means connected to said outer shell portion;

said cap portion being rotatably joined to said outer shell portion at the upper portion of said vent chamber thereby allowing for cap rotation without possibility of blood loss from the device, and whereby the cap portion and shell portion are relatively rotatable during oxygenation of blood.

4,440,724

COMPOSITION FOR DETECTING KETONE BODIES AND METHOD OF PREPARATION

David L. Tabb, Beaumont, and Janine P. Burrows, Orange, both of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Filed Nov. 1, 1982, Ser. No. 438,063
Int. Cl.³ G01N *33/64*
U.S. Cl. 422—56 **6 Claims**

3. A test device for the detection of ketone bodies in body fluid prepared by the process comprising;

impregnating a carrier wth an aqueous solution of soluble nitroprusside;

drying the impregnated carrier;

further impregnating the carrier in the area previously impregnated with an aqueous solution including a metal salt, TAPS and TRIS; and

drying the carrier;

the pH of the finished test device being no greater than 7.0.

4,440,725

REGENERATOR TEMPERATURE CONTROL

Harold J. Swindell, Kansas City, and Randall G. Thompson, Odessa, both of Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 193,870, Oct. 3, 1980, now Defensive Publication No. 4,354,957. This application Jul. 22, 1982, Ser. No. 400,832
Int. Cl.³ G01N *31/12*; B01J *8/24*; G05D *7/00, 23/00*
U.S. Cl. 422—62 **3 Claims**

1. Apparatus useful for regenerating cracking catalyst and comprising

(a) a regenerator vessel,

(b) means to introduce cracking catalyst into said vessel,

(c) means for introducing a free oxygen containing gas into said regenerator and into contact with said catalyst,

(d) an analyzer means for automatically analyzing the flue gas in the regenerator for its carbon monoxide content and generating a corresponding analysis signal,

(e) temperature sensor means for automatically measuring the temperature of the flue gas and generating a temperature signal responsive to the measured temperature,

(f) a control system receiving said analysis signal and said temperature signal and generating an output signal for the manipulation of said free oxygen containing gas flow, said control system comprising

(aa) a direct acting controller and a reverse acting controller, both controllers receiving a set point signal,

(bb) a switch means switching the output of one controller or the output of the other controller to the output of the control system, said switch means being connected to the input of the control system, receiving the analysis signal and being adapted to switch from one controller to the other controller and back responsive to said analysis signal and an analysis set point,

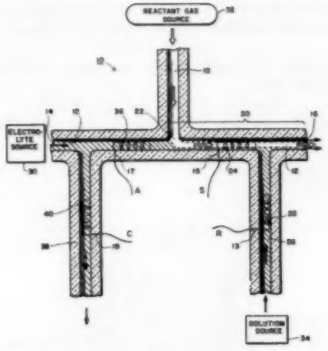
(g) a controller, controlling the flow of free oxygen containing gas into said regenerator, responsive to said output signal from said control system.

4,440,726

APPARATUS FOR ELECTROCHEMICAL DETECTION AND COULOMETRIC TITRATION

Dale M. Coulson, 21 Willow Rd., Apt. 13, Menlo Park, Calif. 94025

Filed Jan. 17, 1983, Ser. No. 458,305
Int. Cl.³ G01N *31/08*
U.S. Cl. 422—89 **9 Claims**



1. A cell for an electrochemical measuring apparatus, which comprises means defining a first capillary tube having an entrance end for introducing an electrolyte solution to said cell and an exit end for removing the solution from said cell, means defining a second capillary tube for introducing a reactant to the electrolyte solution in said cell, said second capillary tube intersecting said first capillary tube between the entrance and the exit ends to define a reaction zone for the reactant and the electrolyte in said first capillary tube at said point of intersection and extending downstream thereof, means defining a third capillary tube intersecting said first capillary tube in the reaction zone downstream of the intersection of said first and second capillary tubes near the exit end for establishing a solution bridge to the reaction zone, a sensing electrode in the reaction zone of said first capillary tube immediately downstream of the intersection of said first and second capillary tubes and upstream of the intersection of said first and third capillary tubes, a reference electrode positioned within the bore of said third capillary tube to be electrically connected to the reaction zone by the solution bridge, said electrodes being contoured to the internal surface of the bore and positioned to contact the solution within the bore of the respective capillary tubes and allowing unobstructed flow therethrough.

4,440,727

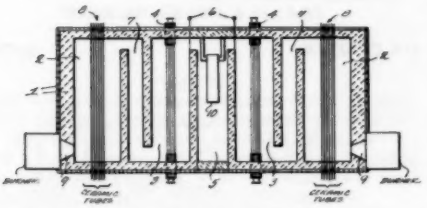
TUBULAR FURNACE FOR PERFORMANCE OF GAS REACTIONS

Heinz Bruck, Lerchenweg 31, 6238 Hofheim/Taunus, Fed. Rep. of Germany

Filed Aug. 17, 1982, Ser. No. 408,827
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134851
Int. Cl.³ B01J *8/06*
U.S. Cl. 422—197 **4 Claims**

1. In a tube furnace suitable for carrying out a gaseous chemical reaction for the production of hydrocyanic acid in ceramic tubes which are suspended in a heating chamber of the furnace, the furnace including burner means, a flue gas channel and recuperator means, the improvement comprising, in combination, an outer wall having a metal covering, two interior heating chambers, a separate burner means for heating each said heating chamber, a plurality of ceramic tubes suspended in each said heating chamber, each said heating chamber having a recuperator chamber in flow communication therewith and a

flue gas channel for receiving flue gases from both said recuperator chambers, said flue gas channel being located between said recuperator chambers, said furnace including a flue gas conduit between each said heating chamber and said respective recuperator chamber, said furnace having an upper cover with



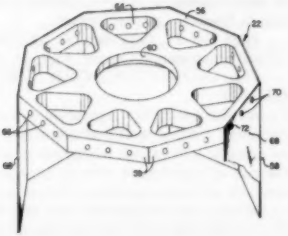
each flue gas conduit receiving flue gas near said upper cover of said furnace, each said recuperator chamber having an opening adjacent a wall opposite said upper cover and each said flue gas conduit being arranged to discharge flue gas into said opening of each said recuperator chamber.

4,440,728

APPARATUS FOR GROWING TUBULAR CRYSTALLINE BODIES

Richard W. Stormont, Warwick, R.I., and Lawrence Eriss, Arlington, Mass., assignors to Mobil Solar Energy Corporation, Waltham, Mass.

Filed Aug. 3, 1981, Ser. No. 289,410
Int. Cl.³ C30B *15/36*
U.S. Cl. 422—246 **12 Claims**



1. Apparatus for use in growing thin-walled hollow tubular crystalline bodies from the melt comprising in combination

a holder substantially in the form of a polygonal plate dimensioned to conform to the interior transverse cross-section of a selected hollow tubular crystalline body having a predetermined interior transverse cross-section;

a stem adapted to suspend said holder from a pulling mechanism; and

a seed in the form of a thin-walled hollow polygonal prism affixed peripherally to said holder.

4,440,729

PROCEDURE FOR CHEMICAL, AUTOMATIC DISSOLUTION OF MOLYBDENUM CORE WIRE IN TUNGSTEN FILAMENT COIL AND A DEVICE FOR IMPLEMENTING THE PROCEDURE

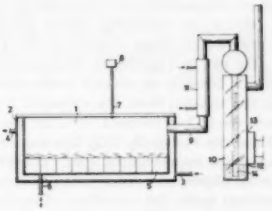
Günther Jönsson, Karlskrona, Sweden, assignor to Lumalampan Aktiebolag, Karlskrona, Sweden

Filed Apr. 14, 1981, Ser. No. 302,215
Claims priority, application Sweden, Sep. 12, 1980, 8006397
Int. Cl.³ C01G *39/00*
U.S. Cl. 423—55 **12 Claims**

1. A process for dissolving a molybdenum core wire in a tungsten filament coil comprising:

(a) reacting said filament coil in a sealed reaction vessel fitted with at least one liquid trap with an acid mixture consisting essentially of 2.5 to 3.5 moles of nitric acid, 12 to 14 moles of sulfuric acid and 7 to 9 moles of water in the presence of an oxygen containing gas to thereby dissolve said core wire; and

(b) continuously monitoring the amount of said oxygen containing gas by a liquid level sensing device being capable of sensing the level of liquid in said liquid trap and comprising an upper and lower liquid level sensing region,



said liquid level sensing device being connected to an oxygen containing gas supply, the amount of liquid in said liquid trap varying directly with the amount of oxygen containing gas in said reaction vessel, wherein when the level of liquid in said liquid trap is at the same level as said lower liquid level sensing region, said oxygen containing gas is supplied to said reaction vessel and when the level of liquid is at the same level as said upper liquid level sensing region, the supply of said oxygen containing gas is stopped.

4,440,730

CHLORINATION OF TITANIUM ORES USING LIGNITIC REACTIVE CARBONS

James P. Bonsack, Aberdeen, Md., assignor to SCM Corporation, New York, N.Y.

Filed Nov. 17, 1982, Ser. No. 442,284
Int. Cl.³ C01G *23/02*
U.S. Cl. 423—74 **6 Claims**

1. In a process for chlorinating a titaniferous material to form $TiCl_4$ wherein discrete particles of titaniferous material and discrete particles of porous carbon reductant having a particle size in the range of about −6 mesh +140 mesh characterized in that it has micropores therein having a pore diameter of less than about 20 Angstroms are fluidized and contacted with a chlorine providing material at a temperature of from 400° C. to 2000° C. until the titanium content of the titaniferous material is substantially chlorinated, the improvement which comprises utilizing as the porous carbon reductant a brown coal char or lignite based carbon characterized by a particle size in the range of about −6 mesh +140 mesh and having initially micropores therein having a pore diameter of about 20 Angstroms to the extent of from about 30% to about 95% of the total surface area of the carbon in said porous carbon reductant whereby vanadium values are substantially removed from the $TiCl_4$.

4,440,731

PROCESS FOR REMOVAL OF CARBON DIOXIDE FROM INDUSTRIAL GASES

Roscoe L. Pearce, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 8, 1981, Ser. No. 299,689
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—228 **3 Claims**

1. In a process for removing carbon dioxide (CO_2) from industrial combustion gases containing the CO_2 and O_2 contacting the gas, in a gas-liquid contactor, with an aqueous solution which contains an alkanol amine absorbent-reactant;

circulating the solution from the contactor to a regeneration step wherein the CO_2 is released from the absorbent, the CO_2 recovered and the essentially CO_2 free absorbent recycled to the contactor, the improvement which consists of employing as the essential additives to said solution, to reduce degradation of the absorbent under the conditions of use and corrosion of the metals in contact with said solution during use, at least above 50 ppm of copper^{+2} and at least from 50 parts per million parts of solution one or more of the following: dihydroxyethylglycine, an alkali metal carbonate, an alkali metal or ammonium permanganate and nickel and/or bismuth oxides.

3. In a process for removing carbon dioxide (CO_2) from industrial combustion gases containing the CO_2 and O_2 by contacting the gas, in a gas:liquid contactor, with an aqueous solution which contains an alkanol amine absorbent-reactant; circulating the solution from the contactor to a regeneration step wherein the CO_2 is released from the absorbent, the CO_2 recovered and the essentially CO_2 free absorbent recycled to the contactor, the improvement which consists of employing as the essential additives to said solution, to reduce degradation of the absorbent under the conditions of use and corrosion of the metals in contact with said solution during use, from at least about 50 ppm of dihydroxyethylglycine and at least about 50 parts per million parts of a thiocyanate salt and nickel and/or bismuth oxides.

4,440,732

HOLLOW GRANULAR PERCARBONATE

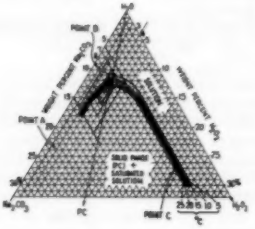
Tsuneshi Takeda; Kazuya Otsuji; Junichi Tamura; Yoshikazu Morii, all of Wakayama; Michio Higashiwaki, Sakai, and Yoshitaka Nakatani, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,547

Claims priority, application Japan, Jul. 4, 1980, 55-91261

Int. Cl.[3] **C01B** *31/00, 15/10*

U.S. Cl. 423—415 P **15 Claims**



1. A process for preparing sodium percarbonate in the form of hollow granules, consisting essentially of the steps of:

forming an aqueous reaction solution consisting essentially of 6.0 to 15.0 wt. % of dissolved Na_2CO_3, 1.5 to 6.0 wt. % of dissolved hydrogen peroxide and the balance is essentially water;

then adding gradually to said aqueous reaction solution amounts of (1) granules of anhydrous sodium carbonate having particle sizes in the range of 50 to 2000 microns and (2) an aqueous hydrogen peroxide solution, at rates effective to continuously maintain (a) the concentration of dissolved hydrogen peroxide in said reaction solution in the range of 1.5 to 6.0 wt. %, (b) the concentration of said dissolved Na_2CO_3 in said reaction solution in the range of 6.0 to 15.0 wt. %, and (c) a molar ratio of said dissolved Na_2CO_3 to dissolved hydrogen peroxide in said reaction solution at a value of at least 2:3, whereby to convert said anhydrous sodium carbonate to sodium percarbonate and to precipitate said sodium percarbonate in the form of hollow granules.

4,440,733

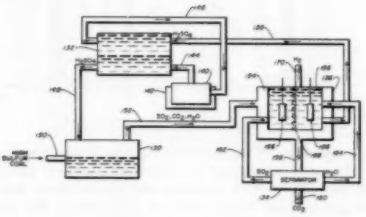
THERMOCHEMICAL GENERATION OF HYDROGEN AND CARBON DIOXIDE

Daniel D. Lawson, Arcadia, and Christopher England, Sierra Madre, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Nov. 6, 1980, Ser. No. 204,477

Int. Cl.[3] **C01B** *13/00*

U.S. Cl. 423—437 **10 Claims**



4. A method of gasifying coal containing at least 2 percent by weight of sulfur comprising:

mixing said coal with concentrated sulfuric acid to form a mixture and heating the mixture to between 300° C. and 400° C. whereby said coal reacts with the sulfuric acid to produce decomposition gases comprising SO_2, H_2O and CO_2.

4,440,734

PROCESS FOR THE RECOVERY OF SULFURIC ACID

Demetre Kougioumoutzakis, Ste-Foy, Canada, assignor to Gouvernement du Quebec, Quebec, Canada

Filed Feb. 11, 1982, Ser. No. 347,785

Claims priority, application Canada, Mar. 24, 1981, 373743

Int. Cl.[3] **C01C** *1/242;* **C01B** *17/90*

U.S. Cl. 423—549 **16 Claims**

1. A process for selectively separating sulfuric acid from liquors containing sulfuric acid and impurities comprising a plurality of metallic ions, which comprises treating by liquid-liquid extraction of said liquors with an organic solvent consisting essentially of tri-isooctylamine, kerosene, and isodecanol under conditions effective to provide a selective liquid-liquid extraction of said liquors to give an organic phase containing the extracted sulfuric acid and substantially no metallic ions, and an aqueous phase containing substantially all said plurality of metallic ions, separating said organic and said aqueous phase, regenerating said organic phase by introducing gaseous NH_3 therein under conditions to form solid $(NH_4)_2SO_4$, and separating said solid $(NH_4)_2SO_4$ from said organic phase thereby regenerating said organic solvent including said tri-isooctylamine, kerosene and isodecanol.

4,440,735

PROCESS FOR PRODUCTION OF PHOTOCONDUCTIVE CADMIUM SULFIDE

Takeshi Ikeda, Tokyo; Atsuko Yamamoto, Komae, and Masanao Kasai, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1982, Ser. No. 340,460

Claims priority, application Japan, Jan. 28, 1981, 56-10966

Int. Cl.[3] **H01C** *31/00;* **C01B** *17/00;* **H01L** *31/00;* **H01B** *1/06*

U.S. Cl. 423—561 B **3 Claims**

1. A process for production of photoconductive cadmium sulfide, characterized in that a flux is added in an amount from about 20 to 65 weight percent based on the cadmium sulfide, and the resulting mixture is fired at a temperature higher than the melting point of said flux by at least 50° C., said flux being a mixture of $CdCl_2$ and alkali metal chloride said alkali metal chloride being present in an amount from 10 mole percent to 90

mole percent, based on the total flux wherein the total alkali metal chloride present in the process is supplied solely from said flux.

4,440,736

TITANIUM-BASED BODY-CENTERED CUBIC PHASE ALLOY COMPOSITIONS AND ROOM TEMPERATURE HYDRIDE-FORMING REACTIONS OF SAME

Arnulf J. Maeland, Succasunna; George G. Libowitz, Brookside, and George Rak, Pinebrook, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 420,465, Sep. 20, 1982, abandoned. This application May 2, 1983, Ser. No. 490,599

Int. Cl.³ C01B *6/24*

U.S. Cl. 423—644 **11 Claims**

1. A method of producing a metal hydride which comprises reacting hydrogen gas at a temperature between about 0° C. and about 100° C. with a solid solution alloy having a body-centered cubic phase structure and comprising:

(a) a body-centered cubic phase structure comprising titanium and a second metal selected from the group consisting of molybdenum, vanadium and niobium; and

(b) dissolved in said body-centered cubic phase structure, wherein said second metal is vanadium or niobium or molybdenum, at least about 1 atom percent of a third metal selected from the group consisting of aluminum, cobalt, chromium, copper, manganese, nickel, iron, gallium, germanium and silicon;

wherein the reaction rate of said solid solution alloy with hydrogen at said temperature is at least about ten times the reaction rate of unalloyed titanium with hydrogen at said temperature and identical hydrogen pressures.

4,440,737

ROOM TEMPERATURE REACTION OF VANADIUM-BASED ALLOYS WITH HYDROGEN

George G. Libowitz, Brookside; James F. Lynch, Plainfield, and Arnulf J. Maeland, Succasunna, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 420,467, Sep. 20, 1982, abandoned. This application May 2, 1983, Ser. No. 490,768

Int. Cl.³ C01B *6/24*

U.S. Cl. 423—644 **10 Claims**

1. A method of producing a vanadium-based metal hydride which comprises reacting hydrogen gas at a temperature between about 0° C. and 100° C. with a vanadium-based binary solid solution alloy having a body-centered cubic structure and having a formula $V_{1-x}M_x$, wherein M is a metal selected from the group consisting of manganese, chromium, cobalt, iron, nickel and mixtures thereof and wherein x varies from at least about 2 atom percent up to the solubility limit of cobalt, iron, nickel and up to about 20 mol percent of manganese and up to about 40 mol percent of chromium in said solid solution alloy;

Wherein the reaction rate of said solid solution alloy with hydrogen at said temperature is at least about 100 times the reaction rate of un-alloyed vanadium with hydrogen at said temperature and identical hydrogen pressures and wherein the reacting of said solid solution alloy with hydrogen at said temperature is effected without preactivation of said solid solution alloy with hydrogen at a elevated temperature.

4,440,738

STABLE RADIOGRAPHIC IMAGING AGENTS

Mahdi B. Fawzi, Fairfield; James J. Benedict, Cincinnati; Joseph E. Bugaj, Harrison; Charles R. Degenhardt, Cincinnati, and Barry F. Van Duzee, Westchester, all of Ohio, assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 10, 1982, Ser. No. 387,138

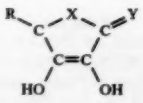
Int. Cl.³ A61K *49/00, 43/00*

U.S. Cl. 424—1.1 **18 Claims**

1. A composition, useful in the preparation of technetium-99m-based imaging agents, comprising:

(a) a pertechnetate reductant; and

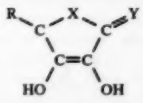
(b) an effective amount, no more than about 25%, by weight, of a reductate stabilizer selected from the group consisting of compounds and mixtures of compounds having the formula:



wherein X is CRR′ O, or NR′, R′ is hydrogen, or lower alkyl, Y is oxygen, sulfur, nitrogen, or CH_2, R is hydrogen, lower alkyl, alkyl containing from 3 to 8 carbon atoms substituted with one or more hydroxy, halogen, amino, or thiol groups, alkyl containing from 1 to 8 carbon atoms halogen-substituted on the first and/or second carbon atom, lower alkenyl nicotinic acid and nicotinamide complexes thereof and pharmaceutically-acceptable salts, amides, and esters, thereof.

15. A composition, useful in the preparation of technetium-99m-based radiographic imaging agents, comprising:

(a) an effective amount of a reductate stabilizer selected from group consisting of compounds and mixtures of compounds having the formula:



wherein X is CRR′ O, or NR′, R′ is hydrogen, or lower alkyl, Y is oxygen, sulfur, nitrogen, or CH_2, R is hydrogen, lower alkyl, alkyl containing from 3 to 8 carbon atoms substituted with one or more hydroxy, halogen, amino, or thiol groups, alkyl containing from 1 to 8 carbon atoms halogen-substituted on the first and/or second carbon atom, lower alkenyl, nicotinic acid, nicotinamide complexes thereof and pharmaceutically-acceptable salts, amides, and esters thereof; dissolved in

(b) an oxidized pertechnetate solution.

4,440,739

RADIOACTIVE DIAGNOSTIC AGENT AND NON-RADIOACTIVE CARRIER THEREFOR

Makoto Azuma, Takarazuka, and Masaaki Hazue, Amagasaki, both of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

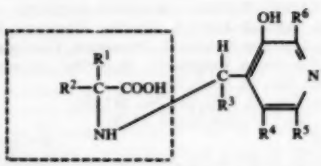
Filed Nov. 25, 1981, Ser. No. 324,903

Claims priority, application Japan, Nov. 27, 1980, 55-167135

Int. Cl.³ A61K *43/00, 49/00*

U.S. Cl. 424—1.1 **12 Claims**

1. A non-radioactive carrier comprising an N-pyridoxyl-α-amino acid of the formula:



(I)

wherein R^1 and R^2 are each an atom or an atomic group present in the α-amino acid residue encompassed by the dotted line and R^3, R^4, R^5 and R^6 are each a hydrogen atom, a halogen atom, a C_1–C_{10} alkyl group or a C_1–C_{10} alkyl group substituted with at least one hydrophilic group or its salt, and a reducing agent for pertechnetate.

4,440,740

α-KETO ALDEHYDES AS ENHANCING AGENTS OF GASTRO-INTESTINAL DRUG ABSORPTION

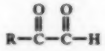
Joseph A. Flx, and Stefano A. Pogany, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 26, 1982, Ser. No. 371,873

Int. Cl.³ A61K *43/00, 49/00, 31/11*

U.S. Cl. 424—1.1 **17 Claims**

1. A method for enhancing the absorption of an orally or rectally administered drug from the gastrointestinal compartment into the bloodstream, said method comprising the steps of preparing a drug form capable of being orally or rectally administered, said drug form comprising a therapeutically effective dosage amount of a drug capable of being absorbed into the bloodstream from the gastrointestinal compartment said drug comprising antibiotics, xanthines, anticancer agents, polypeptides, antiarthritic, cardiovascular agents, antidiabetics, antiulcers, antifungals, antinauseants, sedatives, diuretics, antihypertensives, anti-inflammatories, anthelmintics, antiviral agents, radio-opaques and radionuclide diagnostic agents, polynucleotides, or anti-Parkison agents and an α-keto aldehyde of the formula:



wherein R is hydroxy, phenyl, substituted phenyl or lower alkyl (C_{1-5}) and wherein the substituents on the substituted phenyl radical can be halo, lower alkyl, (C_{1-5}) or hydroxy and the pharmaceutically acceptable acid addition salts when R is hydroxy or a pharmaceutically acceptable salt thereof as adjuvants, said adjuvant being present in said drug in a sufficient amount to be effective in enhancing said absorption and the percentage of the drug to drug plus adjuvant is 5% to 50% by weight and administering said drug form into said gastrointestinal compartment.

4,440,741

BICARBONATE-CONTAINING STICK DEODORANT

Frank W. Marschner, Whitehouse Station, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 845,503, Oct. 25, 1977, abandoned. This application Feb. 16, 1979, Ser. No. 12,936

Int. Cl.³ A61K *7/32*

U.S. Cl. 424—65 **20 Claims**

1. A stable opaque water-based deodorant stick comprising a water-insoluble amount of sodium or potassium bicarbonate as the essential deodorizing agent, dispersed by means of 0.1–10% suspending agent in an aqueous polyhydric alcohol solidified by an alkali metal salt of a saturated C_{14}–C_{20} fatty acid gelling agent, said polyhydric alcohol constituting about 20–90% by weight of the total composition.

4,440,742

BICARBONATE-CONTAINING STICK DEODORANT

Frank W. Marschner, Whitehouse Station, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 845,503, Oct. 25, 1977, abandoned. This application Feb. 16, 1979, Ser. No. 12,938

Int. Cl.³ A61K *7/32*

U.S. Cl. 424—65 **17 Claims**

1. A stable transparent water-based deodorant stick comprising a water-soluble amount of at least 0.1% by weight of sodium or potassium bicarbonate as the essential deodorizing agent, dissolved in an aqueous polyhydric alcohol, solidified by an alkali metal salt of a saturated C_{14}–C_{20} fatty acid gelling agent, said polyhydric alcohol constituting about 20–90% by weight of the total composition.

4,440,743

HAIR CARE COMPOSITIONS

Joseph A. Faucher, 45 Maple Hill, Pleasantville, N.Y. 10570

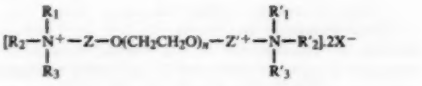
Continuation of Ser. No. 41,617, May 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 811,038, Jun. 29, 1977, abandoned. This application Mar. 10, 1982, Ser. No. 356,758

Int. Cl.³ A61K *7/06*; A45D *7/00*

U.S. Cl. 424—70 **11 Claims**

1. A method of conditioning hair which comprises applying to said hair an effective conditioning amount of an aqueous composition comprising:

A. from about 0.3 to about 5 weight percent of a compound of the formula:



wherein:

R_1, R_1', R_2, R_2', and R_3, and R_3' are the same or different and aeight aliphatic carbon atoms;

Z and Z' are the same or different and are divalent aliphatic organic radicals having from 1 to 8 aliphatic carbon atoms and are divalent hydroxy-alkylene, alkylene groups, divalent radicals of esters, divalent radicals of carboxylic acids, or divalent radicals of ketones;

n is an integer from 2 to 50;

X is chloride or bromide; and

B. water.

4,440,744

QUATERNARY, COPOLYMERIC, HIGH MOLECULAR WEIGHT AMMONIUM SALTS BASED ON ACRYLIC COMPOUNDS, AND THEIR USE IN COSMETICS

Dieter Strasilla, Weil am Rhein, Fed. Rep. of Germany; Hubert Meindl, Riehen, Switzerland; Laszlo Moldovanyi, Basel, Switzerland, and Charles Fearnley, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

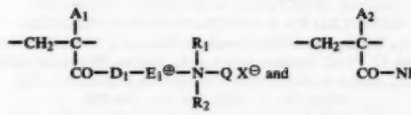
Division of Ser. No. 286,920, Jul. 27, 1981. This application Sep. 28, 1982, Ser. No. 425,600

Claims priority, application Switzerland, Aug. 1, 1980, 5876/80

Int. Cl.³ A61K *7/08, 7/06*

U.S. Cl. 424—70 **14 Claims**

12. A method of hair treatment to give ease of wet and dry combing which comprises the step of applying to the hair a cosmetic which contains at least one copolymeric, quaternary ammonium salt which is soluble or forms a microemulsion in an aqueous surfactant system, which has a molecular weight distribution of 10^4 to 10^9, the molecular weight of at least 5 percent by weight of the copolymer being 10^7 and 10^9, and comprises, in any order, recurring structural elements of the formulae



in which A_1 and A_2 are each hydrogen or methyl, D_1 is oxygen or —NH—, E_1 is alkylene having 1 to 4 carbon atoms unsubstituted or substituted by hydroxyl, R_1 and R_2 are each methyl or ethyl, Q is alkyl or hydroxyalkyl having 1 to 4 carbon atoms or benzyl and $X^{\ominus}$ is the radical of at least one anionic sulfonate surfactant.

4,440,745

ABRASIVE COMPOSITIONS

Helmut Schmidt, Höchberg, and Alfred Kaiser, Kist, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 332,100

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048369

Int. Cl.[3] **A61K** *31/74, 31/695*

U.S. Cl. 424—78 **8 Claims**

7. A method for treating acne comprising applying to the human skin an effective acne treatment amount of a composition comprising a porous, organo-modified silicic acid heteropolycondensate as an abrasive, said heteropolycondensate being prepared by hydrolytic polycondensation of:

(a) from 35 to 90% by weight of at least one silicon-functional silane of the formula (I):

$$SiR_4 \quad (I),$$

wherein X is hydrogen, halogen, alkoxy, acyloxy or an $—NR_2$ group, in which R is hydrogen and/or alkyl, with the proviso that not all of X are hydrogen;

(b) from 10 to 50% by weight of at least one organo-silane of the formula (II):

$$SiR'_aX_{(4-a)} \quad (II),$$

wherein X is as defined above; R′ is alkyl, alkenyl, aryl, aralkyl or alkylaryl; and a is an integer of 1, 2 or 3;

(c) optionally from 0 to 15% by weight of at least one organo-functional silane of the formula (III):

$$SiR'_bX_cR''Y)_{(4-b-c)} \quad (III),$$

wherein R′ and X are as defined above; R″ is straight-chain or branched alkylene, optionally interrupted by oxygen or sulfur atoms or —NH— groups; phenylene, alkylphenylene or alkylenephenylene; Y is halogen, unsubstituted or substituted amino, unsubstituted or substituted anilino, or an aldehyde, keto, carboxy, hydroxy, mercapto, cyano, hydroxyphenyl, diazo, carboxylic acid alkyl ester, sulfonic acid (SO_3H) or phosphoric acid (PO_3H_2) group; b is 0 or an integer of 1 or 2; c is an integer of 1, 2 or 3; and/or

(d) optionally from 0 to 40% by weight of at least one compound selected from the group consisting of substantially involatile oxides of elements selected from the group consisting of the main group *Ia* to V*a* and the side group IV*b* or V*b* of the Periodic Table, which are soluble in the reaction medium, and compounds of these elements which are capable of forming a substantially involatile oxide soluble in the reaction medium, in the presence of at least the amount of water stoichiometrically required for hydrolysis and optionally in the presence of a condensation catalyst and/or an organic solvent, followed by removing any solvent present and drying and comminuting the silicic acid heteropolycondensate obtained, and at least one topically acceptable carrier of adjuvant.

8. A method for clensing, scouring or polishing delicate surfaces comprising applying to a delicate surface an effective amount of a composition comprising a porous, organo-modified silicic acid heteropolycondensate as an abrasive, said heteropolycondensate being prepared by hydrolytic polycondensation of:

(a) from 35 to 90% by weight of at least one silicon-functional silane of the formula (I):

$$SiX_4 \quad (I),$$

wherein X is hydrogen, halogen, alkoxy, acyloxy or an $—NR_2$ group, in which R is hydrogen and/or alkyl, with the proviso that not all of X are hydrogen;

(b) from 10 to 50% by weight of at least one organo-silane of the formula (II):

$$SiR'_aX_{(4-a)} \quad (II),$$

wherein X is as defined above; R′ is alkyl, alkenyl, aryl, aralkyl or alkylaryl; and a is an integer of 1, 2 or 3;

(c) optionally from 0 to 15% by weight of at least one organo-functional silane of the formula (III):

$$SiR'_bX_cR''Y)_{(4-b-c)} \quad (III),$$

wherein R′ and X are as defined above; R″ is straight-chain or branched alkylene, optionally interrupted by oxygen or sulfur atoms or —NH— groups; phenylene, alkylphenylene or alkylenephenylene; Y is halogen, unsubstituted or substituted amino unsubstituted or substituted anilino, or an aldehyde, keto, carboxy, hydroxy, mercapto, cyano, hydroxyphenyl, diazo, carboxylic acid alkyl ester, sulfonic acid (SO_3H) or phosphoric acid (PO_3H_2) group; b is 0 or an integer of 1 or 2; c is an integer of 1, 2 or 3; and the sum of b+c is an integer of 1, 2 or 3; and/or

(d) optionally from 0 to 40% by weight of at least one compound selected from the group consisting of substantially involatile oxides of elements selected from the group consisting of the main groups *Ia* to V*a* and the side group IV*b* or V*b* of the Periodic Table, which are soluble in the reaction medium, and compounds of these elements which are capable of forming a substantially involatile oxide soluble in the reaction medium, in the presence of at least the amount of water stoichio-metrically required for hydrolysis and optionally in the presence of a condensation catalyst and/or an organic solvent, followed by removing any solvent present and drying and comminuting the silicic acid heteropolycondensate obtained,

and at least one carrier.

4,440,746

GRANULAR PESTICIDE COMPOSITION

Michael J. Maglio, Glenolden, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 28, 1982, Ser. No. 437,381

Int. Cl.[3] **A01N** *57/00, 57/26*

U.S. Cl. 424—78 **4 Claims**

1. A granular slow release soil pesticide composition prepared by mixing from about 5 to about 90% by weight of an aqueous solution of polyvinyl alcohol and from about 2 to about 50% of a compatible pesticide plus 0 to about 80% of at least one filler selected from the class consisting of diatomites, attapulgites, bentonites, talcs, montmorillonites, perlites, vermiculites, calcium carbonates, corn cob grits, wood flour, lignin sulfonates, and mixtures thereof with from about 1 to about 20% of a borate until said ingredients react to form a gel, drying the gel, and grinding the dried product to the desired particle size.

4,440,747

MONOCLONAL ANTIBODY-RICIN HYBRIDS AS A TREATMENT OF MURINE GRAFT-VERSUS-HOST DISEASE

David M. Neville Jr., Bethesda, and Richard J. Youle, Kensington, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 186,735, Sep. 30, 1980, Pat. No. 4,359,457. This application Feb. 19, 1982, Ser. No. 350,223

Int. Cl.³ A61K *39/00*

U.S. Cl. 424—85 2 Claims

1. A process for the treatment of graft versus host disease comprising

removing bone marrow cells from a murine donor;

in vitro treating the donor cells with anti-thy 1.2-ricin in the presence of excess lactose; and

injecting the treated cells into a murine recipient.

4,440,748

STRAIN OF *ESCHERICHIA COLI* BY BACTERIAL CONJUGATION

Amy C. Graham, Avenel, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 3, 1982, Ser. No. 373,388

Int. Cl.³ A61K *39/108;* C12N *15/00, 1/20*

U.S. Cl. 424—92 5 Claims

1. A biologically pure culture of a microorganism which is a strain of *Escherichia coli* synthesizing both K88 and K99 antigens, with access number ATCC 39076.

4. A vaccine for prevention of colibacillosis comprising K88 and K99 pili purified from a strain of *Escherichia coli* with access number ATCC 39076 or the whole inactivated cell and a pharmaceutically acceptable carrier.

4,440,749

PREVENTIVE AND TREATING AGENT FOR BLOOD LIPIDS ABNORMALITY AND/OR ARTERIOSCLEROSIS

Shigemi Fujisaki; Takashi Fujisaki; Junichi Yoshida, and Yasuhiro Fujisaki, all of Nishinomiya, Japan, assignors to Kaken Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1983, Ser. No. 484,313

Claims priority, application Japan, Apr. 30, 1982, 57-71494

Int. Cl.³ A61K *37/48*

U.S. Cl. 424—94 4 Claims

1. A method of preventing or treating blood lipids abnormality comprising administering to a patient in need of such therapy an effective amount of pronase or serrathiopeptinase to prevent or treat said blood lipids abnormality.

4,440,750

OSTEOGENIC COMPOSITION AND METHOD

Julianne Glowacki, Jamaica Plain, Mass., and Bruce B. Pharriss, Palo Alto, Calif., assignors to Collagen Corporation, Palo Alto, Calif. and President and Fellows of Harvard College, Cambridge, Mass.

Filed Feb. 12, 1982, Ser. No. 348,414

Int. Cl.³ A61K *35/32, 37/00*

U.S. Cl. 424—95 18 Claims

1. An osteogenic composition comprising a plastic dispersion of particulate demineralized bone and reconstituted collagen fibers dispersed in a continuous aqueous phase having a substantially physiological pH and ionic strength.

4,440,751

BROAD SPECTRUM ANTIBIOTIC COMPLEX PRODUCED BY A NOVEL MICROMONOSPORA

Jay A. Waitz, Far Hills; Joseph A. Marquez, Montclair; Mahesh G. Patel, Verona, and Ann C. Horan, Metuchen, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

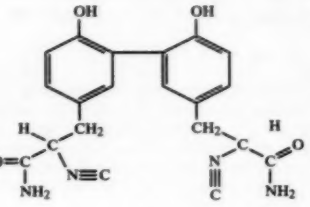
Filed Oct. 6, 1980, Ser. No. 194,490

Int. Cl.³ A61K *35/00, 31/275;* C07C *121/80;* C12P *13/02*

U.S. Cl. 424—114 6 Claims

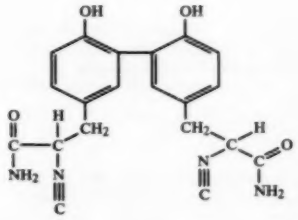
1. A composition of matter having substantial antibacterial activity produced by cultivating a strain of *Micromonospora echinospora* var. *challisensis* having the identifying characteristics of NRRL 12255 in a pH and temperature controlled aqueous nutrient medium having assimilable sources of carbon and nitrogen under controlled aerobic conditions until a composition of matter having substantial antibiotic activity is produced, which composition of matter yields an antibiotic complex designated hazymicin complex, said composition of matter consisting essentially of a mixture of hazymicin component 5 and hazymicin component 6, wherein said components are represented by the formulae

Component 5



and

Component 6



4,440,752

ANTIBIOTICS Y-16482 α AND/OR Y-16482 β, A PROCESS FOR PRODUCTION THEREOF, AND A PHARMACEUTICAL COMPOSITION CONTAINING EITHER OR BOTH OF THEM

Tomohiko Munakata; Katsuyoshi Isagai, both of Nakatsu; Yoshifumi Ikeda, Fukuoka; Junichi Sakai, Nakatsu, and Hideo Matsuki, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries Ltd., Japan

PCT No. PCT/JP81/00151, § 371 Date Feb. 19, 1982, § 102(e) Date Feb. 19, 1982, PCT Pub. No. WO82/00146, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 1, 1981, Ser. No. 355,735

Claims priority, application Japan, Jul. 7, 1980, 55-92921

Int. Cl.³ A61K *35/00;* C12P *1/04*

U.S. Cl. 424—118 6 Claims

1. Antibiotic Y-16482 α or Y-16482 β, hydrochloride of which having the following characters;

(I) Antibiotic Y-16482 α, hydrochloride of which having the following characters:

(1) Appearance: pale yellow powder

(2) Melting point: it begins to carbonize at 215° C. and to liquefy at 260° C.

(3) Elemental analysis: C 55.10%, H 6.61%, N 8.88% $Cl^{\ominus}$ 11.40%
(4) Exo-alanyl group exists
(5) Solubility: soluble in water, methanol, sparingly soluble in chloroform, ether and benzene.
(6) Specific rotation: $[\alpha]_D^{21} - 106°$ (c=0.5, methanol)
(7) Ultraviolet absorption spectrum (concentration: 25.4 mc g/ml. in methanol): λmax=270 nm ($E_{1\ cm}^{1\%}$=145) (See FIG. 1)
(8) Infrared absorption spectrum (KBr method): main absorption (cm^{-1}) 3200, 2950, 1660, 1460, 1246, 1000 (See FIG. 2)
(9) Thin-layer chromatography (silica gel): Rf=0.6 (toluene:chloroform:methanol=1:3:2), Rf=0.45 (n-butanol:acetic acid:water=4:1:1)
(10) Color reaction: positive to ninhydrin and Dragendorff reaction
(11) Alkalinity-Acidity-Neutrality: amphoteric compound or

(II) Antibiotic Y-16482 β, hydrochloride of which having the following characters:
(1) Appearance: pale yellow powder
(2) Melting point: it begins to carbonize at 230° C. and to liquefy at 300° C. or a higher temperature
(3) Elemental analysis: C 54.83%, H 6.54%, N 9.01%, $Cl^{\ominus}$ 11.99%
(4) Molecular weight: peak of molecular ion according to high sensitive mass spectrum is 524.2629±5.7 mmu.
(5) Molecular formula: $C_{28}H_{36}N_4O_6.2HCl\ H_2O$
(6) Exo-alanyl group exists.
(7) Solubility: soluble in water and methanol, sparingly soluble in ethyl acetate, chloroform, ether and benzene.
(8) Specific rotation: $[\alpha]_D^{21} - 144°$ (c=0.5, methanol)
(9) Ultraviolet absorption spectrum (in methanol, concentration 20.6 mcg/ml); max=271 nm ($E_{1\ cm}^{1\%}$=162) (See FIG. 3)
(10) Infrared absorption spectrum (KBr method): main absorption (cm^{-1}) 3350, 3200, 2950, 1660, 1460, 1240 (See FIG. 4)
(11) Thin-layer chromatography (silica gel): Rf=0.5 (toluene:chloroform:methanol=1:3:2), Rf=0.4 (n-butanol:acetic acid:water=4:1:1)
(12) Color reaction: positive to ninhydrin, Dragendorff reaction
(13) Alkalinity-Acidity-Neutrality: amphoteric compound

4,440,753

PURIFICATION OF GLYCOPEPTIDE ANTIBIOTICS USING NON-FUNCTIONAL RESINS

Mack H. McCormick, Westlake, Oreg., and Gene M. Wild, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 15, 1982, Ser. No. 358,399
Int. Cl.³ A61K *135/00*
U.S. Cl. 424—124 **9 Claims**

1. A process for purifying a glycopeptide antibiotic selected from actaplanin or vancomycin which comprises:
A. contacting an aqueous solution thereof with a macroporous, non-ionic styrene-divinylbenzene copolymer adsorption resin having an average pore volume of 0.5 to 4.5 ml/g, a surface area of 200 to 800 m^2/g, and a pore diameter of 40 to 1300 Å;
B. separating the contacted resin from the aqueous solution;
C. washing the resin with an aqueous solution having a pH value of about 1 to about 9, and containing about 3 to about 50% by volume of a polar organic solvent;
D. recovering the glycopeptide from the aqueous washing solution by crystallization, concentration or decantation.

4,440,754

ANTI-INFLAMMATORY AND ANTI-ULCER COMPOUNDS AND PROCESS

John R. J. Sorenson, 1167 Hollywood Ave., Cincinnati, Ohio 45224

Division of Ser. No. 910,421, May 30, 1978, Pat. No. 4,221,785, which is a division of Ser. No. 563,778, Mar. 31, 1975, abandoned. This application May 23, 1980, Ser. No. 152,588
Int. Cl.³ A61K *33/34, 31/30*
U.S. Cl. 424—140 **5 Claims**

1. A method of treating gastrointestinal ulcers and arthritis comprising the administration of a therapeutically effective amount of an organic coordination compound of copper, said compound comprising the reaction product of copper and an amino acid or alkaline earth salt thereof.

4,440,755

SPECIAL HEALING POWDER FOR LIVESTOCK

Edgar C. Weathers, 1801 S. 22nd St., Louisville, Ky. 40210

Continuation-in-part of Ser. No. 69,598, Aug. 24, 1979, abandoned. This application Sep. 6, 1983, Ser. No. 529,274
Int. Cl.³ A61K *33/18*
U.S. Cl. 424—150 **8 Claims**

1. Composition for promoting the healing of a wound of an animal, comprising:
from 82.05 to 95.52 volume percent lime;
from 1.41 to 10.81 volume percent alum; and
from 2.70 to 8.45 volume percent salt, which has been well mixed and blended.

4,440,756

LIGHT-STABLE PESTICIDAL COMPOSITIONS

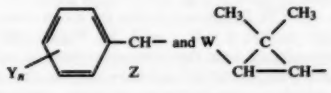
Jean-Jacques Herve, Aubagne; Jean-Claude Suglia, Le Destrousse, and Colette Meinard, Marseille, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jun. 9, 1981, Ser. No. 271,989
Claims priority, application France, Jun. 11, 1980, 80 12960; Jan. 16, 1981, 81 00752
Int. Cl.³ A01N *25/22*
U.S. Cl. 424—174 **30 Claims**

1. A light stable pyrethrinoid composition comprising (a) at least one liquid vehicle, (b) at least one surface-active agent soluble in the said liquid vehicle, (c) at least one azodyestuff stabilizer selected from the group consisting of a mixture of 1-[{4-(phenylazo)-phenyl}- azo]-3-naphthalenol and 4-[{4-(phenylazo)-phenyl}-azo]-phenol (a component of Scarlet R), 1-[4-(4-phenylazo-phenyl)-azo]- naphthalene (Red organol BS), 1-[{2-methyl-4-(2-methylphenylazo)-phenyl}-azo]-2-naphthalenol (Red Sudan IV), 1-[(1-naphthalenyl)-azo]-2-naphthalenol (Scarlet 2R for fat), 1-(phenylazo)-2-naphthalenol (Sudan I), 1-[(2-hydroxy-4-methyl-phenyl)-azo]-2-naphthalenol (Sudan II), 1-[{dimethyl-4-[(dimethyl-phenyl)-azo}-phenylazo]-2-naphthalenol (Red to fat 5B), 2-[(2-methoxypheny)-azo]-phenol (Red to fat G), 4-[(4-ethoxyphenyl)-azo]-1-naphthalenol (Brown to fat B), and 1-[{4-(phenylazo)-phenyl}-azo]-2-naphthalenol and (d) at least one ester of the formula

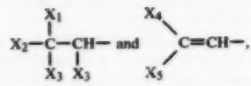
I

wherein Y is selected from the group consisting of

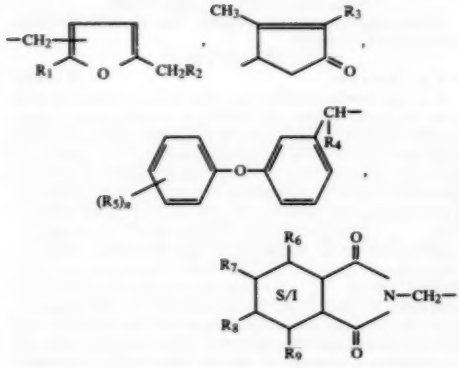


in its various stereoisomeric forms and mixtures thereof, Z is alkyl of 1 to 6 carbon atoms, Y is selected from the group

consisting of hydrogen, halogen, —CN, —NO_3, alkyl of 1 to 4 carbon atoms and alkoxy of 1 to 4 carbon atoms, n is 0,1,2 or 3, W is selected from the group consisting of



X_1 is selected from the group consisting of hydrogen, fluorine, chlorine and bromine, X_2 is selected from the group consisting of fluorine, chlorine and bromine, X_3 is selected from the group consisting of chlorine, bromine and iodine, X_4 is a halogen and X_5 is a halogen optionally other than that of X_4 and due to asymetric carbon atom in W, the compounds are in the A isomer or B isomer form or mixtures thereof and R is selected from the group consisting of



and benzyl optionally substitued with at least one member of the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms, alkadienyl of 4 to 8 carbon atoms, methylenedioxy, benzyl and halogens, R_1 is selected from the group consisting of hydrogen and methyl, R_2 is selected from the group consisting of monocyclic aryl and —CH_2—C≡CH, R_3 is an aliphatic of 2 to 6 carbon atoms having at least one carbon-carbon insaturation, R_4 is selected from the group consisting of hydrogen, —CN, CH_3 and —C≡CH, R_5 is selected from the group consisting of chlorine and methyl, n is 0, 1 or 2, R_6, R_7, R_8 and R_9 are individually selected from the group consisting of hydrogen, chlorine and methyl and S/I indicates that the ring may be aromatic, dihydro or tetrahydro the alcoholic moiety R—OH being capable of containing one or more asymetric carbon atoms and of existing in the form of various stereoisomers.

4,440,757

PHARMACEUTICAL COMPOSITION COMPRISING DERIVATIVE OF AMINOBENZOIC ACID FOR REGULATING PROSTAGLANDIN

Chikao Yoshikumi, Kunitachi; Yoshio Ohmura, Funabashi; Fumio Hirose, Tokyo; Masanori Ikuzawa, Tachikawa; Kenichi Matsunaga, Tokyo; Takayoshi Fujii, Tokyo; Minoru Ohhara, Tokyo, and Takao Ando, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 84,467, Oct. 12, 1979, Pat. No. 4,322,409, and a continuation-in-part of Ser. No. 81,190, Feb. 10, 1979, Pat. No. 4,322,408, and a continuation-in-part of Ser. No. 102,535, Dec. 11, 1979, Pat. No. 4,313,939, and a continuation-in-part of Ser. No. 102,224, Dec. 10, 1979, Pat. No. 4,315,921, said Ser. No. 84,467, said Ser. No. 81,190, is a continuation-in-part of Ser. No. 24,095, Mar. 26, 1979, abandoned, said Ser. No. 102,535, is a continuation-in-part of Ser. No. 39,218, May 15, 1979, abandoned, said Ser. No. 102,224, is a continuation-in-part of Ser. No. 39,282, May 15, 1979, abandoned. This application Aug. 1, 1980, Ser. No. 174,543

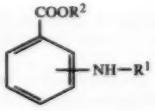
Claims priority, application Japan, Apr. 6, 1978, 53-40594; Apr. 10, 1978, 53-42014; Apr. 10, 1978, 53-42015; Apr. 11, 1978, 53-42576; May 26, 1978, 53-63146; Dec. 29, 1978, 53-161385; Dec. 29, 1978, 53-161386; Jul. 5, 1980, 55-91113

The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.

Int. Cl.³ A61K *31/70*

U.S. Cl. 424—180 **8 Claims**

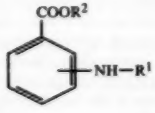
1. A pharmaceutical composition having an activity of regulating production or metabolism of prostaglandins in a mammal in dosage unit form, which comprises a dosage effective to produce said activity of a compound of the formula



wherein R^1 is selected from the group consisting of the residual groups formed by removing OH at 1 (alpha)- or 1(beta) position from arabinose, xylose, rhamnose, glucose, galactose, mannose and fructose, and R^2 is hydrogen atom or an alkyl of one to four carbon atoms,

or a pharmaceutical acceptable salt thereof; and a pharmaceutically acceptable carrier or a diluent therefor.

5. A method for regulating the production and metabolism of prostaglandin in a mammal, which comprises administering an effective amount of a compound represented by the general formula:



wherein R^1 denotes one member selected from the group consisting of the residual groups formed by removing OH at 1(alpha)- or 1(beta) position from arabinose, xylose, rhamnose, glucose, galactose, mannose and fructose, and R^2 is a hydrogen atom, an alkyl group of one to four carbon atoms or a pharmaceutically acceptable metal.

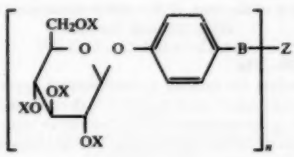
4,440,758

POLY-CATION SALTS OF BIS(OR TRIS)[4-O-MONOHEXOSE-OXY]-ARYLENE SULFATE DERIVATIVES

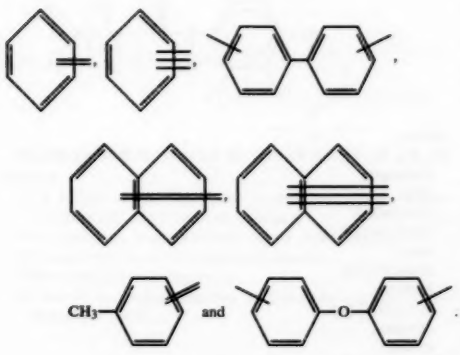
Janis Upeslacis, Pomona, N.Y.; Robert E. Schaub, Upper Saddle River, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 25, 1982, Ser. No. 436,208
Int. Cl.³ A61K *31/70*; C07H *15/22*
U.S. Cl. 424—180 **18 Claims**

7. A method of modulating the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement modulating amount of a pharmaceutically acceptable compound selected from those of the formula:



wherein X is $—SO_3M$ and M is a nontoxic pharmaceutically acceptable cation salt, wherein the salt forming moiety is selected from the group consisting of alkali metal, alkaline earth metal, aluminum, ammonia, zinc and substituted ammonia selected from the group consisting of trialkylamine (C_1–C_6), piperidine, pyrazine, alkanolamine (C_2–C_6) and cycloalkylamine (C_3–C_6); B is selected from the group consisting of —NHCO— and $—NHSO_2—$; n is an integer 2 or 3; and Z is an arylene selected from the group consisting of:



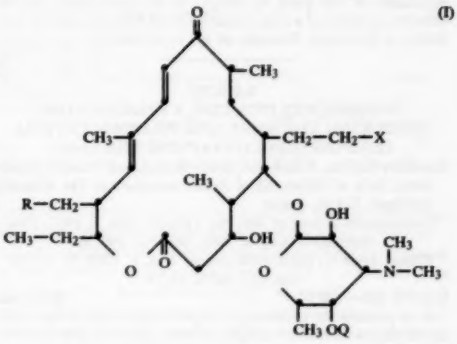
4,440,759

20-AMINO TYLOSIN DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Satoshi Omura, 12-7 Seta 5-chome, Setagaya-ku, Tokyo, and Akira Nakagawa, 30-31 Sumiyoshi-cho 2-chome, Fuchu-Shi, Tokyo, both of Japan

Filed Feb. 24, 1983, Ser. No. 469,535
Claims priority, application Japan, Feb. 25, 1982, 57-29480
Int. Cl.³ A61K *31/71*; C07H *15/08*
U.S. Cl. 424—180 **10 Claims**

1. A macrolide of formula (I):



(I)

where R is mycinosyloxy,
where Q is hydrogen or mycarosyl,
where X is a group of formula:

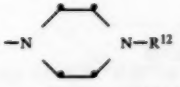
where:

(i) R^{10} and R^{11} independently represent C_{1-4} alkyl, C_{3-10} cycloalkyl; or a group of formula:

$$—(CH_2)_n—Ph$$

where n is 0, 1 or 2, and Ph is phenyl or phenyl substituted by a C_{1-4} alkoxycarbonyl, amino, halogen, C_{1-4} alkyl or C_{1-4} alkoxy group;

(ii) one only of R_{10} and R^{11} represents hydrogen or a group of formula:



where R^{12} is hydrogen or C_{1-4} alkyl, or

(iii) R^{10} and R^{11} taken together with the adjacent nitrogen atom form a heterocyclic ring selected from piperazino and morpholino; or a pharmaceutically-acceptable salt, or an acyl ester derived from a monocarboxylic acid having from 2 to 7 carbon atoms, thereof.

10. A veterinary formulation which comprises as an active ingredient an amount of a compound of claim 1 which is effective to suppress or treat microbial infections caused by gram-positive bacteria, Mycoplasma or Pasteurella associated with one or more physiologically-acceptable carriers or vehicles therefor.

4,440,760

FOOD SUPPLEMENT

Rex E. Newnham, 144 Collins St., Thornbury, Australia 3071

Filed Jul. 27, 1981, Ser. No. 287,235
Int. Cl.³ A61K *31/695*
U.S. Cl. 424—184 **14 Claims**

1. A composition useful for the treatment of arthritis which comprises from about 2 to about 500 parts by weight of a boron-containing compound; Guaiacum in an amount up to an equivalent of 150 parts by weight of the dried herb; Berberis in an amount up to an equivalent of 150 parts by weight of the

dried herb; Harpagophytum recumbens in an amount up to an equivalent of 150 parts by weight of the dried herb; and an effective amount of a compound selected from the group consisting of Rhus-tox, Bryonia, or mixtures thereof.

4,440,761

INTERFERON INDUCER, A PROCESS FOR PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Yasuhiko Kojima, Yokohama; Seishi Konno, and Takashi Hashimoto, both of Tokyo, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 119,325, Feb. 7, 1980. This application Aug. 6, 1981, Ser. No. 290,283
Claims priority, application Japan, Aug. 6, 1980, 55-107955
Int. Cl.³ A61K *35/78*
U.S. Cl. 424—195 10 Claims

1. A process for producing a water-soluble interferon inducer having a moleculer weight of from about 10,000 to about 200,000 from a plant tissue, comprising extracting said interferon inducer with water from the seed of a plant belonging to the genus Carthamus containing said interferon inducer at a temperature of from ambient to the boiling point of the extraction mixture for a period of up to 5 days sufficient to extract the major portion of said interferon inducer present in said tissue, forming a supernatant from the extracted solution, fractionating the supernatant to yield fractions containing the major portion of said interferon inducer present in the supernant, and recovering said interferon inducer therefrom.

4,440,762

PROTECTION OF THE GASTRIC MUCOSAL LINING FROM DAMAGE BY ASPIRIN AND RELATED DRUGS

Kim D. Rainsford, Kingston Beach, and Michael W. Whitehouse, Aranda, both of Australia, assignors to The Australian National University, Canberra, Australia

Filed Nov. 3, 1978, Ser. No. 957,575
Claims priority, application Australia, Nov. 9, 1977, 2352
Int. Cl.³ A61U *31/60*
U.S. Cl. 424—230 3 Claims

1. A pharmaceutical formulation consisting essentially of aspirin, sodium acetate and D-glucose in molar proportions of 1:3:3.

4,440,763

USE OF 4-AMINOSALICYCLIC ACID AS AN ANTI-INFLAMMATORY AGENT

Myron J. Lover, Mountainside, N.J., assignor to Block Drug Company, Inc., Jersey City, N.J.

Filed Mar. 18, 1981, Ser. No. 245,035
Int. Cl.³ A61K *31/60*
U.S. Cl. 424—230 10 Claims

1. A method of treating inflammation which comprises administering to a mammal having an inflammatory condition an anti-inflammatory effective amount of a composition consisting essentially of 4-aminosalicylic acid or a pharmaceutically acceptable ester, salt, pro-drug or complex thereof.

4,440,764

WATER SOLUBLE ESTERS OF STEROID-OXAZOLE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Giangiacomo Nathansohn, and Giorgio Winters, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Apr. 27, 1981, Ser. No. 258,098
Claims priority, application Italy, Apr. 28, 1980, 21671 A/80
Int. Cl.³ A61K *31/58*
U.S. Cl. 424—241 3 Claims

1. 11β,21-dihydroxy-2'-methyl-5'H-pregna-1,4-dieno[17,16-d]-oxazole-3,20-dione-21-hemisuccinate or a pharmaceutically acceptable salt thereof.

3. A pharmaceutical composition for parenteral administration which contains 11β,21-dihydroxy-2'-methyl-5'H-pregna-1,4-dieno[17,16-d]oxazole-3,20-dione-21-hemisuccinate or a pharmaceutically acceptable salt thereof, as the active ingredient in combination with a pharmaceutically acceptable carrier.

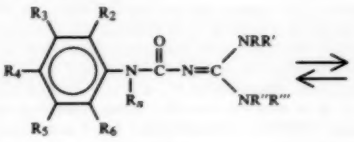
4,440,765

AMIDINOUREAS

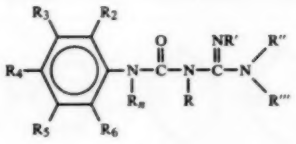
Julius Diamond, Morris Plains, N.J., and George H. Douglas, Malvern, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 59,914, Jul. 23, 1979, Pat. No. 4,304,786, which is a continuation of Ser. No. 942,247, Sep. 14, 1978, Pat. No. 4,204,000, which is a continuation-in-part of Ser. No. 787,673, Apr. 14, 1977, abandoned, which is a division of Ser. No. 558,187, Mar. 31, 1975, Pat. No. 4,060,635. This application Dec. 8, 1981, Ser. No. 328,763
The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.
Int. Cl.³ A61K *31/17, 31/275*
U.S. Cl. 424—244 3 Claims

1. A method for treating gastrointestinal hyperacidity in a human or mammal in need thereof which comprises the oral or parenteral administration of an effective amount of an amidinourea of the general formula I or its tautomeric form II when R is hydrogen:



I



II

where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are
hydrogen,
halo,
loweralkyl,
halologweralkyl,
nitro,
loweralkoxy,
hydroxy,
arloweralkoxy,
acyloxy,
cyano,
halologweralkoxy or
loweralkylsulfonyl;
R and R' are hydrogen or loweralkyl;
R" and R'" are
hydrogen,
loweralkyl,
loweralkenyl,
cycloalkenyl up to 9 carbon atoms,
cycloalkylloweralkyl,
loweralkyl,
cycloalkyl
aralkyl,
loweralkynyl,
haloalkyl,
hydroxyalkyl,
alkoxyalkyl,
cyanoalkyl,
aminoalkyl,

mono- and di- loweralkylaminoalkyl,
carbamoylalkyl,
mono- and di- carbamoylalkyl,
carboxyalkyl,
alkoxycarbonylalkyl,
aralkoxycarbonylalkyl,
formyl,
acyl,
acylalkyl,
alkylsulfonyl or
aralkylsulfonyl;

R'' and R''' together may form a 5–7 atom ring which may include 0–2 hetero atoms of N, O or S;

R_n is hydrogen or loweralkyl provided at least one of R, R', R'' and R''' is other than hydrogen; and the non-toxic acid addition salts thereof.

4,440,766

3,7-DISUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS

Takashi Kamiya, Suita; Kunihiko Tanaka, Toyonaka; Yoshiharu Nakai, Otsu, and Kazuo Sakane, Amagasaki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

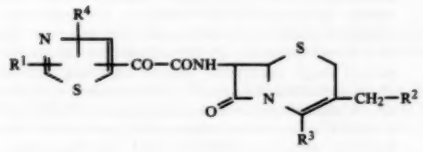
Division of Ser. No. 772,734, Feb. 28, 1977, Pat. No. 4,303,655. This application Aug. 10, 1981, Ser. No. 291,777

Claims priority, application United Kingdom, Mar. 9, 1976, 9425/76; Oct. 4, 1976, 41145/76

Int. Cl.³ C07D *501/22;* **A61K** *31/545*

U.S. Cl. 424—246 **14 Claims**

1. A compound of the formula:



wherein

R^1 is amino, lower alkylamino, a protected amino, a protected lower alkylamino or hydroxy,

R^2 is hydrogen, lower alkanoyloxy or carbamoyloxy

R^3 is carboxy or an esterified carboxy and

R^4 is hydrogen or halogen, or

R^2 and R^3 are linked together to represent a group of the formula: —COO—.

4,440,767

DERIVATIVES OF CEPHALOSPORANIC ACID, PROCESSES FOR THEIR PRODUCTION AND THEIR USE

Hans Fliri, and Helmut Hamberger, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

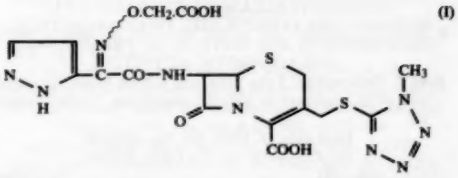
Filed Jan. 18, 1982, Ser. No. 340,435

Claims priority, application Switzerland, Jan. 19, 1981, 317/81

Int. Cl.³ A61K *31/545;* **C07D** *501/56*

U.S. Cl. 424—246 **11 Claims**

1. 7-[(carboxymethoximino)-1H-pyrazol-3-yl-acetyl]amino-3-desacetoxy-3-(1-methyl-1H-tetrazol-5-yl-thio)cephalosporanic acid of formula I,



(I)

and chemotherapeutically acceptable salts thereof with bases as well as chemotherapeutically acceptable solvates thereof.

5. A chemotherapeutic composition comprising a compound of the formula I, as claimed in claim 1, in free acid form or in the form of a chemotherapeutically acceptable salt thereof, with a base or in the form of a chemotherapeutically acceptable solvate thereof, together with a chemotherapeutically acceptable diluent or carrier.

4,440,768

HEXAHYDROPYRROLO[3,4-c]QUINOLINE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS, AND METHODS FOR THEIR USE

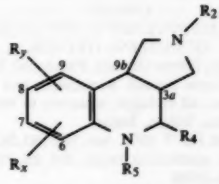
Howard S. Shapiro, Wilmington, Del., assignor to ICI Americas inc., Wilmington, Del.

Division of Ser. No. 223,527, Jan. 8, 1981, Pat. No. 4,350,814, which is a division of Ser. No. 87,458, Oct. 22, 1979, Pat. No. 4,268,513. This application Jul. 8, 1982, Ser. No. 396,156

Int. Cl.³ C07D *491/14, 491/22;* **A61K** *31/535*

U.S. Cl. 424—248.4 **11 Claims**

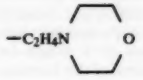
1. A compound selected from the group consisting of hexahydropyrrolo[3,4-c]quinolines of the following formula (I):



(I)

wherein

R_2 is



R_4 is hydrogen, C_1–C_3 alkyl or phenyl;

R_5 is hydrogen, $C_{1\text{-}6}$ alkyl, C_3–C_6 cycloalkyl, acetyl, benzyl or CH_2CF_3; and

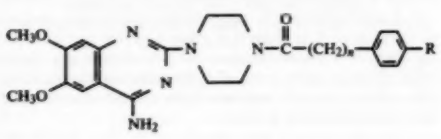
R_x and R_y, which may be the same or different, are hydrogen, halogen, trifluoromethyl, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, hydroxy or cyano, or when R_x and R_y are alkoxy on adjacent carbons, they combine to form a 5-membered methylene dioxy or a 6-membered ethylene dioxy ring, and the pharmaceutically-acceptable acid addition salts thereof.

4,440,769
2-(4-PHENYLALKANOYLPIPERAZIN-1-YL) QUINAZOLINE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHOD OF PRODUCING α_1 ANTAGONISTIC ACTIVITY

John F. DeBernardis, Lake Villa, and Martin Winn, Deerfield, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

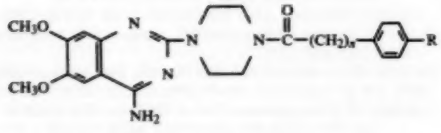
Filed Feb. 11, 1983, Ser. No. 465,846
Int. Cl.³ A61K *31/505*; C07D *403/04*
U.S. Cl. 424—251 16 Claims

1. A compound of the formula



wherein n is 3, 4 or 5, and R is $-NH_2$ or $-N_3$, or a pharmaceutically acceptable acid addition salt thereof.

14. A method of producing antagonistic activity in an α_1-adrenergic receptor comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound of the formula



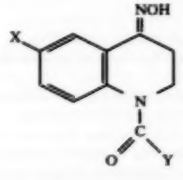
wherein n is 3, 4 or 5, and R is $-NH_2$ or $-N_3$, or a pharmaceutically acceptable acid addition salt thereof, sufficient to produce said activity.

4,440,770
DIURETIC, HYPOTENSIVE AND ANTIEDEMIC QUINOLINE OXIMES

Ei Mochida, Tokyo; Haruo Ohnishi, Funabashi; Kazuo Yamaguchi, Koganei; Yasuo Suzuki, Kawaguchi, and Hiroshi Kosuzume, Yokohama, all of Japan, assignors to Mochida Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,242
Claims priority, application Japan, Jul. 28, 1980, 55-103273; Mar. 19, 1981, 56-39909
The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.
Int. Cl.³ A61K *31/47*
U.S. Cl. 424—258 14 Claims

7. A method for treating a disease selected from the group consisting of hypertension and edema which comprises administering to a human body needing treatment for such a disease an effective amount of a 6-halo-4-oximino-1,2,3,4-tetrahydroquinoline derivative of the formula (I):



(I)

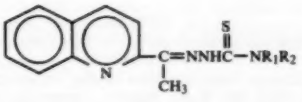
or a pharmaceutically acceptable salt thereof, wherein X represents a halogen atom, and Y represents a straight-chain or branched-chain alkyl group having 1–4 carbon atoms, a phenyl-substituted lower alkyl group, a phenylalkenyl group, a lower alkoxy group or a lower alkyl-substituted amino group.

4,440,771
2-ACETYL QUINOLINE THIOSEMICARBAZONES USEFUL IN TREATMENT OF GONORRHEA, MALARIA OR BACTERIAL INFECTIONS

John P. Scovill, Silver Spring; Daniel L. Klayman, Chevy Chase; Samuel P. Massie, Laurel, all of Md.; Steven D. Grant, Lander, Wyo.; Armando Gonzalez, Orlando, Fla.; Norman E. Morrison, Baltimore, Md., and Arthur S. Dobek, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 12, 1982, Ser. No. 348,462
Int. Cl.³ C07D *215/12*; A61K *31/47*
U.S. Cl. 424—258 54 Claims

1. A quinoline thiosemicarbazones compound of the formula



or a pharmaceutically-acceptable acid addition salt thereof wherein

R_1 is alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 10 carbon atoms; substituted alkyl of 1 to 12 carbon atoms (wherein the substituent is amino, alkylamino of 1 to 4 carbon atoms, dialkylamino of 1 to 4 carbon atoms in each alkyl group, cycloalkyl of 3 to 10 carbon atoms, hydroxy, COO alkyl of 1 to 4 carbon atoms, phenyl, or pyridyl); alkenyl of 2 to 6 carbon atoms; alkynyl of 3 to 6 carbon atoms; substituted benzyl (wherein the substituent is methyl or phenyl on the alpha carbon atom, or the substituent is methyl, dimethyl, halo, dihalo, or ethoxy on the phenyl ring); adamantyl; phenyl; naphthyl; substituted phenyl or substituted naphthyl (wherein the ring is mono-, di-, or trisubstituted and the substituents are alkyl of 1 to 4 carbon atoms, halo, alkoxy of 1 to 4 carbon atoms, hydroxy, phenoxy, trifluoromethyl, dimethylamino, diethylamino, or pyridyl; thienyl; indolyl; furyl; acridyl; quinolyl; or pyridazinyl; and

R_2 is hydrogen or is selected from the group of radicals listed above for R_1, in which case R_1 and R_2 may be the same or different; or

R_1 and R_2 are taken together with the nitrogen atom to which they are attached to form a heterocyclic ring selected from the group consisting of:

(1) alkylenimino having 3 to 13 carbon atoms;

(2) alkylenimino having 3 to 13 carbon atoms which may contain one double bond and/or is mono- or disubstituted with alkyl having 1 to 4 carbon atoms, hydroxy, phenyl, or benzyl;

(3) alkylenimino having 3 to 13 carbon atoms which is either bridged by an alkylene group having 1 to 3 carbon atoms, or is fused to a phenyl ring, or is attached by a spiro linkage to an ethylene ketal group;

(4) homopiperazinyl; homopiperazinyl substituted with alkyl having 1 to 4 carbon atoms; piperazinyl; or piperazinyl substituted with alkyl having 1 to 4 carbon atoms, dialkyl having 1 to 4 carbon atoms in each alkyl group, phenyl, COO alkyl having 1 to 4 carbon atoms in the alkyl group, trifluoromethylphenyl, halophenyl, benzyl, or pyridyl; and

(5) morpholino; dialkylmorpholino having 1 to 4 carbon atoms in each alkyl group;

provided that:

when R_2 is hydrogen, then R_1 cannot be ethyl, isopropyl, or monochlorophenyl.

54. A method for treating an animal which has a bacterial infection by administering to said animal a therapeutically effective amount of a quinoline thiosemicarbazone compound of claim 1.

4,440,772

ACID ADDITION SALTS OF DEXTROROTATORY ERGOT ALKALOIDS, A PROCESS FOR THE PREPARATION THEREOF AS WELL AS THEIR USE AS MEDICINES

Nebojsa Djordjevic; Rudolf Rucman; Suncica Jovanovic; Breda Bole-Vunduk; Tone Lavric; Boza Lavric; Cvetka Gruskovnjak; Ana Kocjan, and Hermina Krmelj, all of Ljubljana, Yugoslavia, assignors to LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o., Yugoslavia

Division of Ser. No. 58,332, Jul. 17, 1979, abandoned. This application Jun. 2, 1981, Ser. No. 269,212

Claims priority, application Yugoslavia, Jul. 19, 1978, 1736/78

Int. Cl.³ A61U *31/48, 31/475*

U.S. Cl. 424—261 28 Claims

1. A process for the treatment of a condition selected from the group of arterial hypertension, heart insufficiency, heart arrhythmia or cephalalgia, or for inducing a vasoconstrictory effect, which comprises administering to a host in need of said treatment a physiologically active amount of a physiologically compatible acid addition salt of ergotaminine, ergosinine, ergocryptinine, ergocristinine or ergocorninine.

4,440,773

PYRIDYLALKYLENETHIOPRIDYL, -TETRAHYDROPYRIDYL AND -PYRIDINIUM COMPOUNDS

Roger Crossley, and Kay H. Dickinson, both of Reading, England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 217,925, Dec. 18, 1980, Pat. No. 4,343,805, which is a continuation of Ser. No. 98,421, Nov. 29, 1979, abandoned. This application Feb. 19, 1982, Ser. No. 350,442

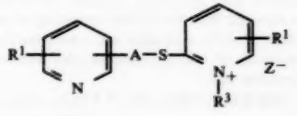
Claims priority, application United Kingdom, Dec. 16, 1978, 48813/78

Int. Cl.³ C07D *213/32;* A61K *31/44*

U.S. Cl. 424—263 9 Claims

1. A compound of the formula

I



wherein the R^1 groups are, independently, hydrogen, hydroxy, loweralkyl, hydroxyloweralkyl, halogen, formyl, phenyl, phenylethyl, halophenyl or $CH(OR^4)_2$ where R^4 is alkyl of 1 to 4 carbon atoms or two R^4 radicals are joined to form a loweralkylene chain; A is a saturated alkylene radical having 1 to 4 carbon atoms, which may be substituted by lower alkyl of 1 to 6 carbon atoms; S is sulfur; R^3 is loweralkyl, phenyl or benzyl; and Z is a pharmaceutically acceptable anion; and pharmaceutically acceptable acid addition salts thereof with a proviso that A is linked to the 2 or 3 position of the pyridine ring.

7. A method of treating ulcers or hypersecretion in a mammal which comprises administering to said mammal in need of said treatment an effective anti-ulcer amount of a compound of formula I as defined in claim 1.

4,440,774

3-AMINO-2-HYDROXYPROPOXYARYL IMIDAZOLE DERIVATIVES

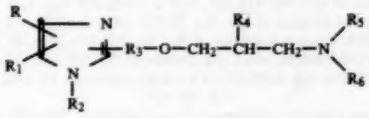
John J. Baldwin, Gwynedd Valley, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 184,501, Sep. 5, 1980, abandoned, which is a continuation of Ser. No. 801,120, May 27, 1977, abandoned, which is a continuation of Ser. No. 641,420, Dec. 17, 1975, Pat. No. 4,134,983, which is a continuation-in-part of Ser. No. 554,372, Mar. 3, 1975, abandoned. This application Apr. 20, 1981, Ser. No. 255,202

Int. Cl.³ A61K *31/415, 31/435, 31/495, 31/535;* C07D *401/04, 403/04, 405/04, 409/04*

U.S. Cl. 424—267 48 Claims

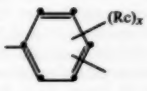
1. A compound of the formula



wherein

R and R_1 are independently selected from hydrogen and heterocyclic group having 5–6 ring atoms, one of which is the hetero atom O, S or N such that only one of R and R_1 is hydrogen, R_2 is selected from hydrogen, C_1–C_{10} linear or branched alkyl, hydroxy C_1–C_{10} linear or branched alkyl and C_3–C_6 alkenyl,

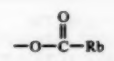
R_3 is selected from naphthyl, tetrahydronaphthyl, indanyl and phenyl having the formula



wherein

Rc is selected from halogen, C_1–C_4 linear or branched alkyl, C_3–C_4 cycloalkyl, C_1–C_4 alkoxy, hydroxy, cyano and phenyl and x is 0, 1, 2, 3 or 4,

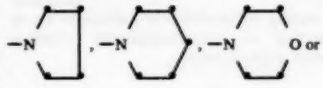
R_4 is hydroxy or

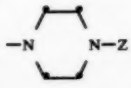


wherein

Rb is C_1–C_6 linear or branched alkyl and

R_5 and R_6 (i) when separate, are independently selected from hydrogen, C_3–C_6 cycloalkyl, C_1–C_6 linear or branched alkyl and monosubstituted C_1–C_6 linear or branched alkyl wherein the substituent is phenyl, methoxyphenyl or dimethoxyphenyl provided that when one of R_5 and R_6 is said substituted alkyl group the other is hydrogen and (ii) when joined together with the N atom form





wherein Z is H or C_1–C_{10} branched or linear alkyl,

and pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

47. Pharmaceutical composition for treating hypertension or effecting β-adrenergic blockade comprising an effective amount of a compound of claim 1 and pharmacologically acceptable compounding agents.

4,440,775

AZOLYL ALKYLTHIOUREAS AND GUONIDINES AND ALKYLAMINONITROETHYLENE COMPOUNDS AS HISTAMINE H_2-ANTAGONISTS

Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden; Geoffrey R. Owen, High Wycombe, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

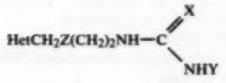
Division of Ser. No. 183,555, Sep. 2, 1980, Pat. No. 4,347,250, which is a division of Ser. No. 35,152, May 2, 1979, Pat. No. 4,247,558, which is a division of Ser. No. 892,231, Mar. 31, 1978, Pat. No. 4,166,856, which is a division of Ser. No. 686,185, May 13, 1976, Pat. No. 4,098,898. This application Jun. 18, 1982, Ser. No. 389,837

Claims priority, application United Kingdom, May 21, 1975, 21817/75; Nov. 20, 1975, 47782/75

Int. Cl.[3] A61K *31/425, 31/42, 31/41*

U.S. Cl. 424—269 6 Claims

1. A compound of the formula:



wherein X is sulphur, $CHNO_2$, N.CN or NH; Y is amino, lower alkylamino, di(lower alkyl)amino, lower alkoxy, phenylethyl, allyl, 2,2,2-trifluoroethyl, or $(CH_2)_nR$; Z is sulphur or methylene; Het is an oxazole, isoxazole, triazole or thiadiazole ring, which ring is attached at a ring carbon, and which ring is optionally substituted by lower alkyl, hydroxy, halogen or amino; n is an integer from 1 to 12; and R is hydroxy, lower alkoxy, amino or lower alkylamino; provided that when X is sulphur, Y is not phenylethyl and provided that when X is NH, Y is 2,2,2-trifluoroethyl or $(CH_2)_nR$ and provided that when X is N.CN, Y is not amino or lower alkylamino, or a pharmaceutically acceptable acid addition salt thereof.

4,440,776

ANTIINFLAMMATORY 4,5-DIPHENYL-2-SUBSTITUTED-THIO-IMIDAZOLES AND THEIR CORRESPONDING SULFOXIDES AND SULFONES

Ulrich Niedballa, and Irmgard Bottcher, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

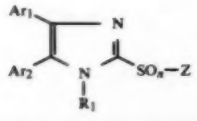
Division of Ser. No. 190,309, Sep. 24, 1980, Pat. No. 4,355,039, which is a division of Ser. No. 41,367, May 22, 1979, Pat. No. 4,269,847. This application Mar. 24, 1982, Ser. No. 361,225

Claims priority, application Fed. Rep. of Germany, May 24, 1978, 2823197

Int. Cl.[3] C07D *233/84;* A61K *31/415*

U.S. Cl. 424—273 R 13 Claims

1. A method of treating inflammation in a mammal which comprises administering an antiinflammatorily effective amount of a compound of the formula



wherein

Z is C_{1-6} alkyl substituted by one hydroxy;

Ar_1 and Ar_2 are independently each phenyl or phenyl substituted by C_{1-4} alkyl, with the proviso that Ar_1 and Ar_2 are not both unsubstituted phenyl;

R_1 is hydrogen, C_{1-4} alkyl or C_{1-4} alkyl substituted by hydroxy, C_{1-4} alkoxy or C_{1-6} alkanoyloxy; and

n is 0, 1 or 2;

or a physiologically acceptable salt thereof with an acid.

4,440,777

USE OF EUCALYPTOL FOR ENHANCING SKIN PERMEATION OF BIO-AFFECTING AGENTS

Jacob A. Zupan, St. Joseph, Mo., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 7, 1981, Ser. No. 280,967

Int. Cl.[3] A61K *31/19, 31/40*

U.S. Cl. 424—274 11 Claims

1. A composition of matter for topical application comprising from 0.001% to about 80% of the total composition of a systemically or dermally effective non-steroidal anti-inflammatory agent selected from the group consisting of indomethacin, naproxen, fenoprofen, ibuprofen, sulindac and desoxysulindac and a skin permeation enhancing amount of eucalyptol.

4,440,778

ANTI-INFLAMMATORY ANALGESIC CATAPLASM AND PROCESS FOR PRODUCING THE SAME

Ichiro Matsui, Toyama; Tsutomu Tanaka, Kamiichi; Yukio Bando, and Kiyonobu Ohashi, both of Toyama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

Filed Feb. 12, 1982, Ser. No. 348,315

Claims priority, application Japan, Feb. 26, 1981, 56-27199

Int. Cl.[3] A61K *31/40*

U.S. Cl. 424—274 4 Claims

1. An anti-inflammatory analgesic cataplasm comprising:

indomethacin in the range of from 0.1 to 5.0 by weight;

a polyalcohol selected from the group consisting of glycerin, polyethylene glycol, propylene glycol and sorbitol;

a binder selected from the group consisting of gelatin, gum arabic, methyl cellulose, polyvinyl alcohol, hydroxyethyl cellulose, sodium polyacrylate, sodium carboxymethyl cellulose, sodium alginate, propylene glycol alginate, santan gum and a carboxyvinyl polymer;

a vehicle selected from the group consisting of kaolin, bentonite, zinc oxide, titanium oxide and aluminum silicate;

an aromatic alcohol selected from the group consisting of benzyl alcohol and phenethyl alcohol, or a non-ionic surfactant selected from the group consisting of polyoxyethylene sorbitan fatty acid ester and a sorbitan fatty acid ester or mixtures of said aromatic alcohol and said non-ionic surfactants; and

water, said cataplasm having a pH of 5 to 7.

4,440,779

TRICYCLIC DERIVATIVES OF SUBSTITUTED PYRROLE ACIDS AS ANALGESIC AND ANTI-INFLAMMATORY AGENTS

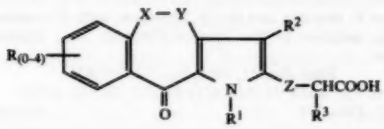
James B. Doherty, New Milford; Conrad P. Dorn, Plainfield; Bruce E. Witzel, Westfield; Debra L. Allison, Scotch Plains, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 279,140, Jun. 30, 1981, abandoned. This application Jun. 4, 1982, Ser. No. 385,232

Int. Cl.[3] A61K *31/55;* C07D *209/94, 491/044*

U.S. Cl. 424—274 14 Claims

1. A compound having the formula:



(I)

or a pharmaceutically acceptable alkali metal, alkaline metal or quaternary ammonium salt thereof wherein there are 0–4 R groups and

R is

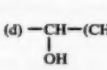
(a) hydrogen;
(b) lower alkyl;
(c) halo-loweralkyl;
(d) hydroxy or lower alkoxy;
(e) halo;
(f) lower alkylthio;
(g) lower alkylsulfinyl;
(h) lower alkylsulfonyl;
(i) lower alkenyl;
(j) phenyl;
(k) substituted phenyl wherein the substituent is loweralkyl, loweralkylsulfonyl, loweralkylsulfinyl, loweralkylthio, loweralkoxy, chloro or fluoro;
(l) carboxy;
(m) carbalkoxy;
(n) cyano;
(o) loweralkylamino or amino;
(p) di(loweralkyl)amino;
(q) lower alkanoyl; or
(r) benzoyl or substituted benzoyl wherein the substituent is fluoro, chloro, loweralkyl or loweralkoxy;

R^1 is

(a) hydrogen;
(b) lower alkyl;
(c) lower alkenyl;
(d) lower alkanoyl;
(e) phenyl or substituted phenyl;
(f) benzoyl or substituted benzoyl;
(g) benzyl or substituted benzyl;
(h) lower alkoxy;
(i) lower alkylamino;
(j) di(loweralkyl)amino; or
(k) hydroxy C_{1-6}alkyl;

Z is

(a) $-(CH_2)_{0-n}$, n being 0–10;
(b) $-CO(CH_2)_{1-n}-$;
(c) $-(CH_2)_{1-n}-CO-$; or



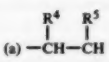
(d)

R^2 is

(a) hydrogen;
(b) lower alkyl;
(c) lower alkenyl;
(d) lower alkoxy; or
(e) $-CH_2OH$;
(f) halo; or
(g) phenyl or substituted phenyl;

R^3 is hydrogen, lower alkyl, hydroxy, loweralkoxy, or halo; and

X-Y is

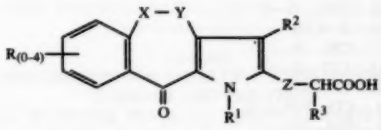


(a)

wherein R^4 and R^5 independently are hydrogen, loweralkyl loweralkoxy or halo;

(b) $-CR^4=CR^5-$;
(c) $-O-CH_2-$;
(d) $-CH_2-O-$;
(e) $-S-CH_2-$;
(f) $-CH_2-S-$;
(g) $-CO-O-$;
(h) $-O-CO-$;
(i) $-CO-NH-$; or
(j) $-NH-CO-$.

9. A method of treatment of inflammatory conditions, fever and pain which comprises the administration to a mammalian species in need of such treatment an effective amount of a compound of formula:



(I)

or a pharmaceutically acceptable alkali metal, alkaline metal or quaternary ammonium salt thereof wherein

there are 0–4 R groups and R is

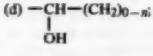
(a) hydrogen;
(b) lower alkyl;
(c) halo-loweralkyl;
(d) hydroxy or lower alkoxy;
(e) halo;
(f) lower alkylthio;
(g) lower alkylsulfinyl;
(h) lower alkylsulfonyl;
(i) lower alkenyl;
(j) phenyl;
(k) substituted phenyl wherein the substituent is loweralkyl, loweralkylsulfonyl, loweralkylsulfinyl, loweralkylthio, loweralkoxy, chloro or fluoro;
(l) carboxy;
(m) carbalkoxy;
(n) cyano;
(o) loweralkylamino or amine;
(p) di(loweralkyl)amino;
(q) lower alkanoyl; or
(r) benzoyl or substituted benzoyl wherein the substituent is fluoro, chloro, loweralkyl or loweralkoxy;

R^1 is

(a) hydrogen;
(b) lower alkyl;
(c) lower alkenyl;
(d) lower alkanoyl;
(e) phenyl or substituted phenyl;
(f) benzoyl or substituted benzoyl;
(g) benzyl or substituted benzyl;
(h) lower alkoxy;
(i) lower alkylamino;
(j) di(loweralkyl)amino; or
(k) hydroxy C_{1-6}alkyl;

Z is

(a) $-(CH_2)_{0-n}$, n is being 0–10;
(b) $-CO(CH_2)_{1-n}-$;
(c) $-(CH_2)_{1-n}-CO-$; or



(d)

R^2 is

(a) hydrogen;
(b) lower alkyl;
(c) lower alkenyl;
(d) lower alkoxy; or
(e) $-CH_2OH$;

(f) halo; or
(g) phenyl or substituted phenyl;
R^3 is hydrogen, lower alkyl, hydroxy, loweralkoxy, or halo; and
X-Y is

(a) $-CH^4-CH^5-$

wherein R^4 and R^5 independently are hydrogen, lower-alkyl loweralkoxy or halo;
(b) $-CR^4=CR^5-$;
(c) $-O-CH_2-$;
(d) $-CH_2-O-$;
(e) $-S-CH_2-$;
(f) $-CH_2-S-$;
(g) $-CO-O-$;
(h) $-O-CO-$;
(i) $-CO-NH-$; or
(j) $-NH-CO-$.

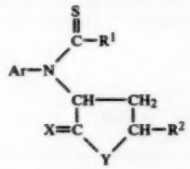
4,440,780

FUNGICIDAL 3-(N-ACYL-N-ARYLAMINO)-AND 3-(N-THIONOACYL-N-ARYLAMINO)-GAMMA-BUTYROLACTONES AND GAMMA-THIOBUTYROLACTONES

David C. K. Chan, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 1, 1979, Ser. No. 44,740
Int. Cl.[3] **A01N** *43/08, 43/10, 43/36;* **C07D** *333/30, 207/26, 307/30*
U.S. Cl. 424—275 **10 Claims**

1. A compound of the formula



wherein Ar is phenyl, naphthyl, or phenyl or naphthyl substituted with 1 to 4 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; R^1 is hydroxymethyl, halomethyl of 1 to 3 of the same or different halogens selected from fluoro, chloro or bromo, alkoxyalkyl of 2 to 6 carbon atoms, alkylthioalkyl of 2 to 6 carbon atoms, phenylthioalkyl of 7 to 10 carbon atoms, phenoxyalkyl of 7 to 10 carbon atoms, phenylthioalkyl or phenoxyalkyl of 7 to 10 carbon atoms substituted on the phenyl ring with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, cycloalkyl or 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms substituted with 1 to 4 of the same or different substituents selected from alkyl of 1 to 4 carbon atoms, fluoro, chloro, bromo, hydroxy or alkoxy of 1 to 4 carbon atoms; and R^2 is hydrogen, chloro, bromo, alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo or alkyl of 1 to 6 carbon atoms; Y is O, S or —NH—; and X is O or S.

7. A method for the control of fungi which comprises contacting said fungi or their habitats with a fungicidally effective amount of a compound of the formula defined in claim 1.

10. A fungicidal composition comprising a biologically inert carrier and a fungicidally effective amount of a compound of the formula defined in claim 1.

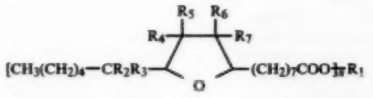
4,440,781

OXYOCTADECANOATES AS PSYCHOTROPIC AGENTS

Herman P. Benecke, and Bob E. Sherwood, both of Columbus, Ohio, assignors to The Vinoxen Company, Inc., Stamford, Conn.

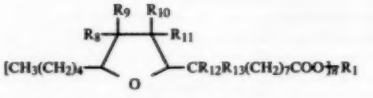
Filed Jun. 11, 1982, Ser. No. 387,636
Int. Cl.[3] **A61K** *31/34;* **C07D** *307/12, 307/32, 307/28*
U.S. Cl. 424—285 **19 Claims**

1. A method for producing a psychotropic response in a human or animal subject suffering from a condition for which a psychotropic response would be therapeutic, comprising administering to said subject a psychotropically effective non-toxic amount of a 9,12-oxyoctadecanoate having the formula I



(I)

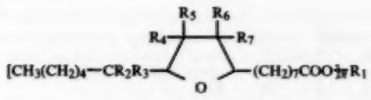
wherein n=1 and R_1 is H, lower alkyl, cyclo(lower)alkyl, aryl(lower)alkyl, lower alkoxy(lower)alkyl, di(lower)alkylamino(lower)alkyl, cyclic amino(lower)alkyl or alkanoylamino(lower)alkyl; or n=2–6 and R_1 is a lower alkyl or cyclo(lower)alkyl polyol residue; and
(a) R_2, R_3, R_4, R_5 and R_6 are each H; and R_7 is OH; or
(b) R_2, R_3, R_4 and R_5 are each H; and R_6 and R_7 together are O; or
(c) R_2, R_3, R_4, R_6 and R_7 are each H; and R_5 is OH; or
(d) R_2, R_3, R_6 and R_7 are each H; and R_4 and R_5 together are O; or
(e) R_2 is OH; and R_3, R_4, R_5, R_6 and R_7 are each H; or
(f) R_2 is OH; R_3, R_4 and R_6 are each H; and R_5 and R_7 together are a C—C bond; or
(g) R_2 and R_3 together are O; and R_4, R_5, R_6 and R_7 are each H; or
(h) R_2 and R_3 together are O; R_4 and R_6 are each H; and R_5 and R_7 together are a C—C bond; or a 10,13-oxyoctadecanoate having the formula II



(II)

wherein n and R_1 are as defined hereinabove; and
(a) R_8, R_9, R_{10}, R_{11} and R_{12} are each H; and R_{13} is OH; or
(b) R_8, R_9, R_{10} and R_{11} are each H; and R_{12} and R_{13} together are O; or
(c) R_8, R_{10} and R_{12} are each H; R_9 and R_{11} together are a C—C bond; and R_{13} is OH; or
(d) R_8 and R_{10} are each H; R_9 and R_{11} together are a C—C bond; and R_{12} and R_{13} together are O; or
(e) R_8, R_9, R_{10}, R_{12} and R_{13} are each H; and R_{11} is OH; or
(f) R_8, R_9, R_{12} and R_{13} are each H; and R_{10} and R_{11} together are O; or
(g) R_8 is OH; and R_9, R_{10}, R_{11}, R_{12}, and R_{13} are each H; or
(h) R_8 and R_9 together are O; and R_{10} R_{11}, R_{12} and R_{13} are each H; or a pharmaceutically acceptable addition salt thereof.

17. A psychotropic composition, consisting essentially of (1) a non-toxic amount effective for producing a psychotropic response in a human or animal subject of a 9,12-oxyoctadecanoate having the formula I



(I)

wherein n=1 and R_1 is H, lower alkyl, cyclo(lower)alkyl, aryl(lower)alkyl, lower alkoxy(lower)alkyl, di(lower)alkylamino(lower)alkyl, cyclic amino(lower)alkyl or alkanoylamino(lower)alkyl; or n=2–6 and R_1 is a lower alkyl or cyclo(lower)alkyl polyol residue; and

(a) R_2, R_3, R_4, R_5 and R_6 are each H; and R_7 is OH; or

(b) R_2, R_3, R_4 and R_5 are each H; and R_6 and R_7 together are O; or

(c) R_2, R_3, R_4, R_6 and R_7 are each H; and R_5 is OH; or

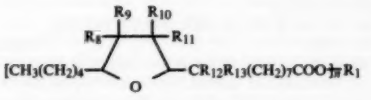
(d) R_2, R_3, R_6 and R_7 are each H; and R_4 and R_5 together are O; or

(e) R_2 is OH; and R_3, R_4, R_5, R_6 and R_7 are each H; or

(f) R_2 is OH; R_3, R_4 and R_6 are each H; and R_5 and R_7 together are a C—C bond; or

(g) R_2 and R_3 together are O; and R_4, R_5, R_6 and R_7 are each H; or

(h) R_2 and R_3 together are O; R_4 and R_6 are each H; and R_5 and R_7 together are a C—C bond; or a 10,13-oxyoctadecanoate having the formula II



(II)

wherein n and R_1 are as defined hereinabove; and

(a) R_8, R_9, R_{10}, R_{11} and R_{12} are each H; and R_{13} is OH; or

(b) R_8, R_9, R_{10} and R_{11} are each H; and R_{12} and R_{13} together are O; or

(c) R_8, R_{10} and R_{12} are each H; R_9 and R_{11} together are a C—C bond; and R_{13} is OH; or

(d) R_8 and R_{10} are each H; R_9 and R_{11} together are a C—C bond; and R_{12} and R_{13} together are O; or

(e) R_8, R_9, R_{10}, R_{12} and R_{13} are each H; and R_{11} is OH; or

(f) R_8, R_9, R_{12} and R_{13} are each H; and R_{10} and R_{11} together are O; or

(g) R_8 is OH; and R_9, R_{10}, R_{11}, R_{12}, and R_{13} are each H; or

(h) R_8 and R_9 together are O; and R_{10} R_{11}, R_{12} and R_{13} are each H; or a pharmaceutically acceptable addition salt thereof;

and (2) a pharmaceutically acceptable carrier;

wherein said composition is in unit dosage form as a tablet, dragee, capsule, ampoule, suppository or sterile injectable preparation.

4,440,782

METHOD OF TREATING VIRAL INFECTIONS

James P. Davidson, Lansing; Barnett Rosenberg, Holt, both of Mich., and Ronald W. Hinz, Avoca, Iowa, assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 773,216, Mar. 1, 1977, Pat. No. 4,258,051, which is a division of Ser. No. 540,109, Jan. 10, 1975, Pat. No. 4,053,587. This application Sep. 18, 1980, Ser. No. 188,343

The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.

Int. Cl.³ A61K *31/28, 31/555*

U.S. Cl. 424—287 **3 Claims**

1. A method for treating an animal afflicted with a viral infection comprising administering to said animal an effective anti-viral amount of a platinum coordination compound having the formula:

$$[Pt(II)A_x(OOC)_2—CRR_1]$$

wherein:

x=1 or 2;

R and R_1 are selected from the group consisting of H, lower alkyl, aryl, aralkyl, alkenyl, cycloalkyl, cycloalkenyl, alkoxy, OH, or combine with the carbon atom to form a cycloalkyl or cycloalkenyl;

when x=1, A is $HR_2N—CHR_3—CHR_4—NR_5H$ and when x=2, A is H_2NR_6 or an amino acid, wherein R_2, R_3, R_4 and R_5 are the same or different and are selected from the group consisting of H. CH_3, C_2H_5, hydroxy and lower alkoxy, provided that R_2 and R_5 may also be aryl or aralkyl and each R_6 is the same or different and is selected from the group consisting of H, lower alkyl, aryl, aralkyl, hydroxy lower alkyl, hydroxyl- and alkoxyl-amines, and alkoxyl alkyl amines, all of said alkyl and alkoxy groups being lower alkyl and alkoxy groups.

4,440,783

COMPOSITION FOR REPELLING ANIMALS FROM GARBAGE AND THE LIKE

Harry M. Downing, Hewitt, N.J., assignor to Bernard Weiss, New York, N.Y.; Jonathan J. Stern, Upper Saddle River, N.J. and Burt B. Houseworth, Elmsford, N.Y.

Filed Feb. 24, 1983, Ser. No. 469,228

Int. Cl.³ A01M *47/46*

U.S. Cl. 424—302 **9 Claims**

1. A composition for repelling animals from garbage comprising:

(a) 1 to 25 weight percent of an active portion containing a minor but repellent effective concentration of an isothyocyanate chosen from the group consisting of allyl isothiocyanate and C_1 to C_4 alkyl isothiocyanate together with an odor masking material for making the composition more acceptable to humans, and

(b) 75 to 99 weight percent of a non-active liquid diluent portion which comprises the major portion of the overall composition.

4,440,784

ANTI-INFLAMMATORY, ANALGESIC, AND ANTIPYRETIC PHARMACEUTICAL COMPOSITION

Ikuo Katsumi, Kobe; Hideo Kondo, Takasago; Katsuji Yamashita; Takayoshi Hidaka, both of Kobe; Kazunori Hosoe, Takasago; Yutaka Ariki, Himeji; Toshiaki Yamashita, Kakogawa, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Chemical Industry Company, Ltd., Osaka, Japan

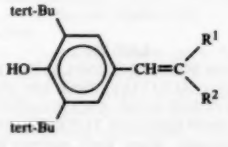
Filed Jan. 5, 1982, Ser. No. 337,130

Claims priority, application Japan, Feb. 5, 1981, 56-16602; Nov. 9, 1981, 56-179949

Int. Cl.³ A61K *31/19, 31/235*

U.S. Cl. 424—308 **4 Claims**

1. An anti-inflammatory, analgesic, and antipyretic pharmaceutical composition which comprises an effective amount of a 3,5-di-tert-butyl-4-hydroxystyrene derivative represented by the general formula:



wherein R^1 stands for a group represented by —$COOR^4$; R^4 is a hydrogen atom or an alkyl group with C_1~C_4; R^2 stands for an alkyl group with C_1~C_4, a hydroxyalkyl group with C_1~C_4, or an acyl group represented by —COR^6; and R^6 is an alkyl group with C_1~C_3 or its pharmaceutically acceptable salt as an active ingredient in combination with pharmaceutical excipients.

4,440,785

METHODS OF USING 2-AMINOBIPHENYLACETIC ACIDS, ESTERS, AND METAL SALTS THEREOF TO TREAT INFLAMMATION

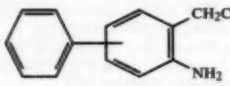
David A. Walsh, Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 202,287, Oct. 30, 1980, abandoned, which is a division of Ser. No. 64,767, Aug. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 851,641, Nov. 15, 1977, abandoned. This application Jan. 13, 1982, Ser. No. 339,211

Int. Cl.³ A61K *31/19;* C07C *149/43*

U.S. Cl. 424—317 8 Claims

1. A method for alleviating inflammation in a living animal body with a minimum of undesirable side effects comprising internally administering to said living animal body an effective amount of a compound having the formula:



wherein R is hydrogen, lower alkyl, sodium or potassium, and the phenyl substituent is in the 3, 4, or 5 position and hydrates thereof.

4,440,786

COMPOUNDS WITH ANTIINFLAMMATORY AND ANALGESIC ACTIVITY, PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIO NS THEREFROM

Leonardo de Vincentiis, Rome, Italy, assignor to Ausonia Farmaceutici s.r.l., Pomezia, Italy

Filed May 20, 1982, Ser. No. 380,124

Claims priority, application Italy, Nov. 24, 1981, 25245 A/81

Int. Cl.³ C07C *59/52;* A01N *37/12*

U.S. Cl. 424—319 10 Claims

1. The compound (2',4'-difluoro-4-biphenyl)-oxyacetic acid of formula I

(I)

or a pharmaceutically acceptable salt thereof with sodium, potassium, magnesium or calcium or an organic base which is lysine, arginine or ethanolamine.

7. A pharmaceutically composition having antiinflammatory and analgesic activity, which comprises as the active ingredient an effective amount of a compound according to claim 1 and inert excipients.

4,440,787

COMPOUNDS WITH ANTIINFLAMMATORY AND ANALGESIC ACTIVITY, PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS THEREFROM

Leonardo de Vincentiis, Rome, Italy, assignor to Ausonia Farmaceutici s.r.l., Pomezia, Italy

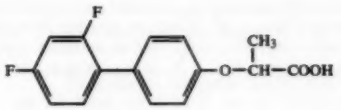
Filed May 20, 1982, Ser. No. 380,125

Claims priority, application Italy, Nov. 24, 1981, 25243 A/81

Int. Cl.³ C07C *59/52;* A01N *37/12*

U.S. Cl. 424—319 10 Claims

1. The compound (2',4'-difluoro-4-biphenyl)oxypropionic acid of formula I



(I)

or a pharmaceutically acceptable salt thereof with a metal which is sodium, potassium, calcium or magnesium or an organic base which is lysine, arginine or ethanolamine.

7. A pharmaceutical composition having antiinflammatory an analgesic activity, which comprises as the active ingredient an effective amount of a compound according to claim 1 and inert excipients.

4,440,788

CYSTEINE DERIVATIVES

Hiroshi Terayama, Tokyo; Yoshiharu Morita, and Kohei Umezu, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

PCT No. PCT/JP81/00107, § 371 Date Dec. 30, 1981, § 102(e) Date Dec. 30, 1981, PCT Pub. No. WO81/03330, PCT Pub. Date Nov. 26, 1981

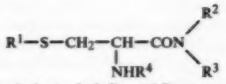
PCT Filed May 11, 1981, Ser. No. 336,377

Claims priority, application Japan, May 13, 1980, 55-63263; Jun. 27, 1980, 55-87272

Int. Cl.³ A61K *31/16;* C07C *149/23, 103/183*

U.S. Cl. 424—320 3 Claims

1. A method for accelerating regeneration of parenchymatous cells of the human or animal liver, when the number or function of said cells is reduced due to hepatic failure due to various hepatopathy inducing factors such as acute and chronic hepatitis or chemical poisoning, which comprises orally or parenterally administering to said human or animal a therapeutically effective amount of a cysteine derivative having the formula:



wherein R_1 is methyl or ethyl, R_2 and R_3 are each hydrogen or a lower alkyl having about 1–6 carbon atoms, and R_4 is acetyl, or a non-toxic pharmaceutically acceptable acid addition salt thereof.

4,440,789

SYNTHETIC ABSORBABLE HEMOSTATIC COMPOSITION

Frank V. Mattei, Piscataway, N.J., and Namassivaya Doddi, Upland, Calif., assignors to Ethicon, Inc., Somerville, N.J.

Filed Nov. 16, 1982, Ser. No. 442,217

Int. Cl.³ A61K *31/74;* C08G *63/08*

U.S. Cl. 424—78 14 Claims

1. A synthetic body absorbable hemostatic composition for use in the control of osseous hemorrhage, comprising from 60% to 80% by weight of purified polydioxanone in a biocompatible base, said polydioxanone having an inherent viscosity in hexafluoroisopropanol at a concentration of 0.1 g/dl and at a temperature of 25° C. of between about 0.03 and 0.15, said base comprising a natural or synthetic oil or wax which is absorbable in the body, said polydioxanone having a sufficiently low inherent viscosity such that the mixture with the base is workable and softenable by hand to bring about a putty-like consistency at room temperature and having a tackiness sufficient for it to adhere readily to a bloody bone surface and yet being able to be manipulated without crumbling or sticking to the surgeon's gloves.

4,440,790

PROCESS FOR STABILIZING PEPPERMINT OIL

Bernie Blackwell, Laurelton, N.Y.; Shelley Netherwood, Brea, Calif., and Dominick J. Piccolo, Brooklyn, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 20, 1982, Ser. No. 450,870
Int. Cl.³ A23L *1/22, 1/222;* A23G *3/30*
U.S. Cl. 426—3 21 Claims

1. A process for preparing a peppermint oil containing a reduced menthofuran content, which comprises reacting the peppermint oil with about 0.5% to about 15% by weight maleic anhydride, based on the weight of peppermint oil to selectively form a menthofuran-maleic anhydride adduct without otherwise affecting the flavoring agent properties of the remaining peppermint oil constituents and recovering the peppermint oil having a reduced menthofuran content.

4,440,791

CULTURED EGG-MILK PRODUCT

Kenneth A. MacKenzie, Stretton, Australia, assignor to The Egg Marketing Board, South Queensland, Australia

Filed May 17, 1982, Ser. No. 378,776
Claims priority, application Australia, Mar. 11, 1982, PF3054
Int. Cl.³ A23C *9/13*
U.S. Cl. 426—43 15 Claims

1. A method of producing a cultured egg milk product from whole or skim milk, skim milk powder, sugar and liquid whole egg or powdered whole egg in liquid form comprising the steps of heating said milk and dissolving said skim milk powder and sugar therein to form a first mixture; homogenizing said first mixture, subsequently heating said first mixture and maintaining said first mixture at an elevated temperature; cooling said first mixture and adding said egg to form a second mixture; adding bacterial cultures to said second mixture, said bacterial cultures being selected to cause fermentation of said second mixture, and incubating said second mixture until a predetermined degree of bacterial growth has been achieved.

4,440,792

METHOD FOR PREVENTING GELATION OF CORN STEEP LIQUOR

Marion M. Bradford; Frank T. Orthoefer, and Kenneth N. Wright, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sep. 7, 1982, Ser. No. 415,192
Int. Cl.³ A23L *1/34*
U.S. Cl. 426—271 13 Claims

1. A method of treating corn steep liquor (CSL) or a liquid CSL composition which comprises the adding to the liquor or composition a Ca++ complexing agent in an amount effective to prevent or reverse the gelling of said corn steep liquor.

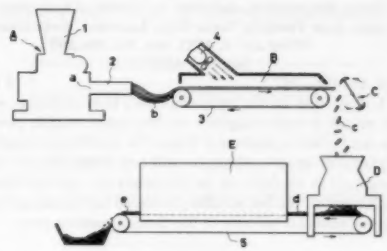
4,440,793

METHOD FOR PRODUCING BREAD CRUMBS

Masao Seki, Kamakura, Japan, assignor to Fuji Foods Industry Co., Ltd., Japan

Filed May 3, 1982, Ser. No. 374,068
Claims priority, application Japan, May 8, 1981, 56-69235
Int. Cl.³ A21D *13/06*
U.S. Cl. 426—549 3 Claims

1. A method for producing bread crumbs which comprises forming a mixture obtained by adding 0.5–6.0% soybean protein to wheat flour, mixing therein suitable amounts of salt, fats, emulsifier, pH adjustor, coloring matter and flavoring as secondary materials, adding α-converted starch to said mixture, adding water thereto without adding yeast, thereafter charging said mixture into an extruder having a die at one end thereof, heating and pressing said mixture while in said extruder and extruding the mixture from said die into a rope-like configuration, simultaneously therewith drawing the rope-like material from said extruder at a speed greater than the extrusion speed to produce bubbles within the rope-like material, flattening a section of the bubbles and rope-like material, cutting and



crushing the material, and drying the same to produce bread crumbs.

4,440,794

INSTANT RICE PUDDING MIX

David L. Davies, Banbury, England, assignor to General Foods Corporation, White Plains, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,443
Int. Cl.³ A23L *1/187, 1/168, 1/195*
U.S. Cl. 426—578 7 Claims

1. An instant rice pudding mix which comprises a mixture of a powder comprising 15 to 35% by weight of a finely divided sugar, 25 to 40% by weight of a starch, 5 to 20% by weight of a finely divided fat; 5 to 25% by weight of a dried skim-milk powder; up to 3% by weight of an emulsifier and 0 to 4% by weight of an edible gum; and granules formed by the extrusion of a dough formed from 87 to 100% by weight of rice flour, up to 4.0% by weight of a starch-complexing agent, up to 5% by weight of an aerating agent and up to 4.0% of dried skim milk powder and/or dried whey powder mixed with a proportion of water sufficient to produce an extrudable dough.

4,440,795

PROCESS FOR THE PREPARATION OF A STABLE CITRUS FLAVORED MALT BEVERAGE

Henry Goldstein, Brookfield; Joseph T. Hoff, Hartland; Charles L. Cronan, Shorewood, and Ch. S. Rao, Milwaukee, all of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 231,971, Feb. 6, 1981, abandoned. This application Jun. 23, 1982, Ser. No. 391,179
Int. Cl.³ C12G *3/06*
U.S. Cl. 426—592 3 Claims

1. A method of preparing a stable citrus flavored alcoholic malt beverage, said method comprising selecting as the feed a beer prepared by the fermentation of grain, said beer comprising water, alcohol, carbohydrates, proteins, amino acids, including sulphur containing amino acids, inorganics, sugars and volatiles, subjecting said beer to reverse osmosis employing a membrane which has a molecular weight cutoff of up to about 200 for organics and a nominal pore size of about 5 Angstroms, then collecting the permeate which consists essentially of water, alcohol, and the organics having molecular weight of up to about 200 which are mostly the volatiles which are responsible for the beer flavor and aroma, and adding citrus flavoring to said permeate.

4,440,796

COLD SOLUBLE POWDERED TEA EXTRACTS

Tito-Livio Lander, and Corine-Madeleine Nielsen, both of Lausanne, Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jul. 9, 1982, Ser. No. 396,895

Int. Cl.³ A23F *3/30*

U.S. Cl. 426—597 9 Claims

1. A process for the production of a cold soluble powdered tea extract which comprises treating a hot soluble powdered tea extract with a mixture of from 25% to 65% by weight of an aliphatic di- or tri-carboxylic acid and from 15% to 65% by weight of an aliphatic di- or tri-carboxylic acid salt based on the weight of the hot soluble powdered tea extract and grinding the resultant mixture to the desired particle size.

4,440,797

METHOD FOR CONTINUOUS PRODUCTION OF CHOCOLATE MASS

Klaus Berkes, Dresden; Helmut Förster, Heidenau; Wolfgang Huth, Dresden; Günter Ritschel; Georg Schebiella, both of Heidenau; Norbert Scholz, and Frank-Gerhard Thomas, both of Dresden, all of German Democratic Rep., assignors to Veb Kombinat Nagema, Dresden, German Democratic Rep.

Continuation-in-part of Ser. No. 221,191, Dec. 29, 1980. This application Apr. 30, 1981, Ser. No. 259,107

Claims priority, application German Democratic Rep., Dec. 29, 1979, 218276

Int. Cl.³ A23G *1/00, 1/14*

U.S. Cl. 426—613 13 Claims

1. A method for the continuous production of a refined chocolate mass, comprising the stepssof preparing a non-refined cocoa mass composed of a mixture of conventional components such as a mixture of cocoa mass with sugar or cocoa mass mixed with sugar, milk powder and cocoa butter; then producing from the non-refined cocoa mass a non-refined chocolate mass by reducing in size the components of the cocoa mass to a fineness required for the refined chocolate mass but still containing undesired aromatic substances, the non-refined chocolate mass being low in fat (in comparison to the refined chocolate mass) and having a friable or pulverized structure; then moving the non-refined chocolate mass in a feeding direction while internally mixing the same with a preheated gas stream flowing in the same feeding direction to remove moisture and undesired volatile components therefrom and to assist in advancing the mass in the feeding direction; simultaneously conching the mass by subjecting it to intensive mechanical mixing and shearing stresses until the mass is plasticized; separating gas from the plasticized mass; increasing liquidity of the mass by adding an emulsifier; thereafter adding to the liquefied mass doses of fat substances to adjust the fat content of the mass to that required in the refined chocolate mass; then homogenizing the completed mass by repeating the intensive conching or mechanical mixing and shearing treatment without the use of a gas stream while cooling the homogenized mass to a lower temperature and discharging the resulting refined chocolate mass for final processing.

4,440,798

LOW COST TEXTURIZED VEGETABLE PROTEIN

Emil A. Huang, Fridley, Minn., assignor to Nabisco Brands, Inc., Parsippany, N.J.

PCT No. PCT/US81/00568, § 371 Date Nov. 8, 1982, § 102(e) Date Dec. 29, 1982, PCT Pub. No. WO82/03750, PCT Pub. Date Nov. 11, 1982

PCT Filed Apr. 29, 1981, Ser. No. 453,578

Int. Cl.³ A23J *3/00*

U.S. Cl. 426—656 12 Claims

1. The method of preparing a textured protein comprising the steps of:

(a) mixing a meal of carbohydrate containing proteinaceous vegetable material with between about 10% and 75% water by weight of the total to form a homogeneous mass;

(b) forming said mass under temperature and pressure conditions which retain the proteins therein in the undenatured state to obtain discrete pieces of a desired configuration having a dough-like consistency wherein a substantial portion of the protein molecules are in the undenatured state and the protein and carbohydrate molecules of said pieces are in substantially the original matrix relationship of the proteinaceous vegetable material; and

(c) cooking said pieces to a meat-like consistency in water in the presence of at least one protein insolubilizing agent present in sufficient concentration to maintain the proteins insoluble in order (1) to denature the proteins in situ whereby contiguous protein molecules interlock to form a three dimensional protein network structure throughout each of the pieces, and (2) to leach out at least some carbohydrates from within the protein structure.

4,440,799

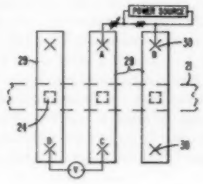
MONITOR FOR IMPURITY LEVELS IN ALUMINUM DEPOSITION

Thomas J. Faith, Jr., Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 22, 1982, Ser. No. 435,971

Int. Cl.³ H01L *21/24*

U.S. Cl. 427—8 9 Claims



1. A method of predicting the degree of post-alloy contact resistance between an aluminum-based film deposited in a vacuum chamber and a silicon substrate therefor comprising:

(a) providing in the chamber a monitor wafer of p-type silicon having a plurality of contact resistance measurement test sites, each test site comprising a region of N^+-doped high conductivity such that contact with the film will occur at a plurality of predetermined areas in said region;

(b) depositing the aluminum-based film on a selected portion of the monitor wafer, said portion including said contact areas and comprising a plurality of Kelvin contacts;

(c) measuring the contact resistance at said contact areas prior to alloying of said film;

(d) determining the distribution of contact resistance in the film from a significant number of such measurements; and

(e) using said determination as an indication of the post-alloy contact resistance.

4,440,800

VAPOR COATING OF POWDERS

David H. Morton, Kyle Bay; Stephen G. Szirmai, Dover Heights, and Edmund C. Potter, St. Ives, all of Australia, assignors to Unisearch Limited, Kensington and Commonwealth Scientific and Industrial Research, Campbell, both of, Australia

Filed Apr. 16, 1981, Ser. No. 255,662

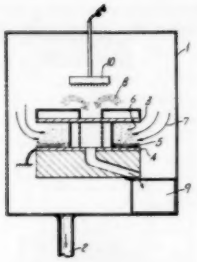
Claims priority, application Australia, Apr. 24, 1980, PE3290/80

Int. Cl.³ B05D *1/04*

U.S. Cl. 427—13 18 Claims

1. A method of vapour coating of a particulate material,

comprising dispersing said particulate material by the application of an electrostatic field and causing a vapour or dispersion



of a coating material to permeate the dispersion of particulate material.

4,440,801

METHOD FOR DEPOSITING A METAL LAYER ON POLYESTERS

Ari Aviram, Yorktown Heights; Veronica I. Mayne-Banton, and Rangaswamy Srinivasan, both of Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 9, 1982, Ser. No. 396,922

Int. Cl.³ C23C 3/02

U.S. Cl. 427—54.1 **20 Claims**

1. A method for deposition of a metal layer onto selected areas of a polyester substrate, comprising the steps of:

irradiating said polyester substrate with ultraviolet radiation of wavelengths less than 220 nm to create acid groups where said substrate is irradiated by said uv radiation,

neutralizing said acid groups in said irradiated polyester substrate to make them more basic, and

electrolessly depositing said metal onto said polyester substrate to form a continuous metal layer thereon, said depositing occurring substantially in those areas of said substrate where said neutralizing has occurred.

4,440,802

PREPARATION OF PREPREGS FROM CELLULOSIC FIBERS USING WATER-BORNE RESIN COMPOSITIONS

Edward Irving, Burwell, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,404

Claims priority, application United Kingdom, Apr. 3, 1982, 8209955; Aug. 5, 1982, 8222600

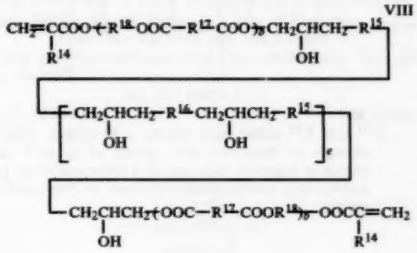
Int. Cl.³ B05D 3/06, 3/02

U.S. Cl. 427—54.1 **10 Claims**

1. A method for the production of prepregs which comprises (1) impregnating cellulosic fibers with a water-borne composition comprising

(a) a photopolymerisable resin, and

(b) an epoxide resin, and then (2) exposing the impregnated fibers to actinic radiation so that (a) becomes photopolymerised, (a) being of formula



VIII

where

b represents zero or 1,

e is an integer of at least 1,

each R^{14} denotes a hydrogen atom or a methyl group,

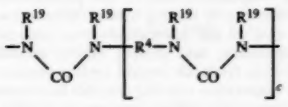
each R^{15} represents the divalent residue of a compound having two glycidyl groups directly attached to an atom or atoms of oxygen, nitrogen, or sulphur, after removal of the said two glycidyl groups,

each R^{16} represents the divalent residue of a dihydric alcohol, a dihydric phenol, a dicarboxylic acid, or a compound containing two groups selected from amide groups and imide groups, after removal of two terminal hydrogen atoms attached to an atom or atoms of oxygen or nitrogen,

each R^{17} denotes an alkylene group of 1 to 6 carbon atoms, an alkenylene group of 2 to 10 carbon atoms, an arylene group of 6 to 10 carbon atoms, or a cycloalkylene or cycloalkenylene group of 5 to 8 carbon atoms,

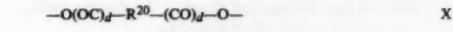
each R^{18} denotes a divalent aliphatic, cycloaliphatic, or araliphatic group of 2 to 8 carbon atoms,

with the proviso that at least 25% of the total of the (e+1) R^{15} and e R^{16} groups each represent a group of the formula



IX

or a group of formula

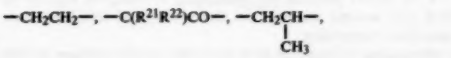


X

wherein

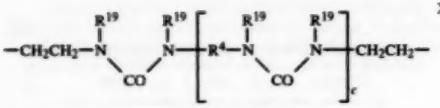
R^4 represents a divalent aliphatic, cycloaliphatic, or araliphatic radical of 1 to 8 carbon atoms,

each R^{19} denotes an alkyl group of 1 to 4 carbon atoms or each pair of R^{19} conjointly represents a group of formula



c and d are each zero or 1,

R^{20} represents a straight or branched chain aliphatic group of 2 to 20 atoms or, provided each d is 1, it may alternatively represent a group of formula



XI

and

R^{21} and R^{22} either each denote a hydrogen atom or a straight or branched alkyl group of up to 9 carbon atoms or together they denote a tetramethylene, pentamethylene, methylpentamethylene, or hexamethylene group.

4,440,803

PROCESS FOR PREPARING ARSENIC-SELENIUM PHOTORECEPTORS

Monroe J. Hordon, Pittsford, and Robert E. Gerace, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 90,835, Nov. 1, 1979, abandoned. This application Apr. 20, 1981, Ser. No. 255,201

Int. Cl.³ B05D 5/12

U.S. Cl. 427—74 **9 Claims**

1. A process of vapor depositing a substantially uniform thin film of photoconductive material on a substrate body which comprises:

positioning a plurality of substrate bodies on a plurality of elongated, horizontally extending cylindrical support mandrels;

rotating each of said mandrels about an associated longitudinal axis thereof and simultaneously transporting said plurality of mandrels in an annular path about a horizontal axis;

establishing an evacuated atmosphere about said mandrels;

vaporizing a suitable photoconductive material, which is positioned in a planar array of crucibles located within the annular path of travel of said mandrels, with at least one additional crucible being positioned in an outrigger configuration at each corner of the planar array, said crucible array extending substantially coextensively along the entire length of the plurality of substrate bodies; and

controlling the evaporation rate of the photoconductive material by means of a sensing system to monitor both evaporation rate of the photoconductive material and crucible temperature, said sensing system including a cascade dual-loop feedback control system continuously blending the evaporation rate and crucible temperature to produce an integrated feedback response to modify resistive power input to said crucibles to thereby establish an evaporation rate profile for the pre-evaporation, evaporation and post evaporation stages of the coating cycle.

4,440,804

LIFT-OFF PROCESS FOR FABRICATING SELF-ALIGNED CONTACTS

Alvin Milgram, Sunnyvale, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Aug. 2, 1982, Ser. No. 404,109

Int. Cl.³ B05D 5/12

U.S. Cl. 427—91 **8 Claims**

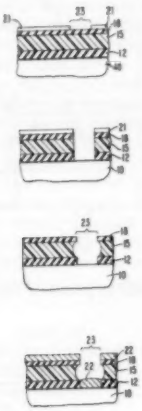
1. A lift-off process for fabricating self-aligned regions of first and second material on the surface of semiconductor structure comprising;

depositing a layer of first material on the surface of the semiconductor;

depositing a layer of a polyamide on the layer of first material;

depositing at least one layer of masking material on the polyimide;

defining openings to the surface of the semiconductor structure through the at least one layer of masking material, the layer of polyimide, and the layer of first material, including the step of isotropically etching substantially only the polyimide in the openings;



depositing second material on the semiconductor structure and on the at least one layer of masking material; and

removing the polyimide and the second material deposited thereon.

4,440,805

STABILIZED DISPERSION FOR ELECTROLESS PLATING CATALYSTS USING CORROSION INHIBITORS AS STABILIZERS

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 105,865, Dec. 21, 1979, Pat. No. 4,273,804, which is a division of Ser. No. 941,044, Sep. 11, 1978, Pat. No. 4,180,600, which is a continuation-in-part of Ser. No. 820,904, Aug. 1, 1977, Pat. No. 4,131,699, which is a continuation of Ser. No. 625,326, Oct. 23, 1975, Pat. No. 4,048,354, and a continuation-in-part of Ser. No. 938,890, Aug. 31, 1978, Pat. No. 4,265,942. This application May 1, 1981, Ser. No. 259,631

The portion of the term of this patent subsequent to Dec. 26, 1995, has been disclaimed.

Int. Cl.³ C23C 3/02

U.S. Cl. 427—97 **13 Claims**

1. A process for the preparation of a substrate prior to electroless metal deposition or chemical metal deposition comprising the step of contacting said substrate with a stable aqueous colloidal dispersion which comprises at least one non-noble catalytic metal capable of electroless plating initiation, and a stabilizer, said stabilizer being a corrosion inhibitor for non-noble metal(s).

4,440,806

RAINFALL SANDER

Georges Muri, Mount Royal, Canada, assignor to Shell-O-Matic Inc., Montreal, Canada

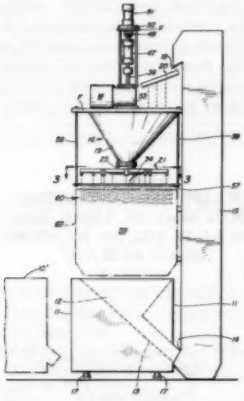
Filed Jul. 13, 1982, Ser. No. 397,908

Int. Cl.³ B05D 1/02

U.S. Cl. 427—180 **10 Claims**

1. A method of coating an article such as a wax pattern with particulate material which comprises providing an article to be coated with a finely divided particulate material, providing a supply of finely divided particulate material, placing said article in downstream relationship to said supply of particulate material, feeding said finely divided particulate material from said supply to form a first central stream of said particulate material, subjecting said stream to the action of a rotating conical flow-controlling member to form an annular stream,

feeding said annular stream through a plurality of hollow rotating arms of varying lengths located peripherally of said rotating conical flow controlling member and forming said stream into a plurality of rotating smaller finely divided steams which are radially dispersed relative to the axially flow direc-



tion of said first stream, and which form a shower of said particulate material dispersed in a substantially uniform flow of said particulate material over a given area downstream of said supply thereof whereby a substantially uniform coating is provided on said article.

4,440,807

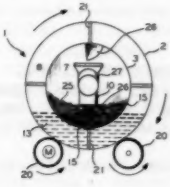
PROCESS AND APPARATUS FOR MAKING RUBBER COVERED CARBON BLACK PELLETS

Thomas J. Gunnell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 145,908, May 2, 1980, Pat. No. 4,337,294. This application Apr. 13, 1982, Ser. No. 367,857

Int. Cl.³ B05D *7/00*; **B32B** *9/00*, *5/16*

U.S. Cl. 427—221 **7 Claims**



1. A process for producing a coated carbon black pellet, which pellet consists essentially of a carbon black pellet core which is substantially free of rubber and a layer of rubber surrounding said carbon black pellet core, said process comprising coating a carbon black pellet core with a layer of said rubber.

4,440,808

METHOD OF UNIFORMLY APPLYING LIQUID TREATING MEDIA TO FORAMINOUS WORKPIECES

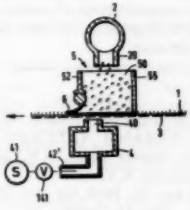
Mathias Mitter, Schloss Holte, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 325,059

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044408

Int. Cl.³ B05D *3/12*

U.S. Cl. 427—244 **10 Claims**



1. A method of uniformly applying a liquid treating medium to a foraminous workpiece, such as a textile web, having an upper surface and a lower surface, comprising the steps of foaming the liquid treating medium; depositing the foamed medium directly on the upper surface of the workpiece within a circumambiently restricted area which is open at the top for admission of foamed medium thereinto and extends downwardly all the way to the upper surface of the workpiece; applying suction to the lower surface of the workpiece to draw some of the foamed medium and liquid released by bursting of the foam bubbles into the workpiece at a single location below the restricted area; and thereafter mechanically pressing additional foamed medium from within the restricted area into the upper surface of the workpiece.

4,440,809

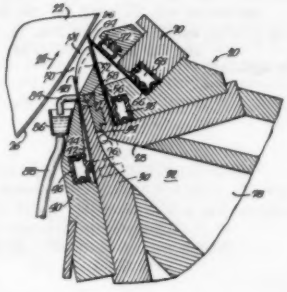
METHOD AND APPARATUS FOR RECIRCULATING COATING LIQUID IN A PAPER COATING APPARATUS

William C. Vreeland, Wisconsin Rapids, Wis., assignor to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Filed Jan. 17, 1983, Ser. No. 458,472

Int. Cl.³ B05C *3/18*

U.S. Cl. 427—356 **18 Claims**



1. In an improved applicator for applying coating liquid to a moving web of paper carried through an application zone, wherein the applicator is of the type comprising a body portion defining a chamber therein having an elongate opening thereto extending substantially transversely across the web; a doctor blade extending from a rear side of said chamber opening substantially transversely across and against the web; an orifice plate at a front side of said chamber opening extending substan-

tially transversely across and toward but spaced from the web to define a gap therewith; means for sealing opposite side ends between said doctor blade and orifice plate, said means for sealing, doctor blade and orifice plate defining said application zone therebetween; and means for introducing coating liquid through said chamber opening and into said application zone for application onto the web, the improvement comprising means at each side end of said opening and application zone for withdrawing coating liquid from an area of said opening and application zone below said means for sealing and said orifice plate gap, whereby stagnant areas of coating liquid do not form at said side ends of said opening and zone and stagnate coating does not build up thereat.

4,440,810

METHOD FOR DECORATING LOW-EXPANSION CERAMIC ARTICLES

Ray B. Forker, Jr., Beaver Dams, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,678
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—376.2 **6 Claims**

1. A method for glazing a low-expansion glass, glass-ceramic or ceramic substrate wherein a fluid suspension of a fritted, high-expansion enameling composition is sprayed onto the surface of the substrate to form a coating and the coating is dried and fired to fuse the composition into a smooth enamel layer, characterized in that:

(a) the fluid suspension consists essentially of a fritted, high-expansion enameling composition and a non-aqueous vehicle, the enameling composition having a fired expansion coefficient of about $45–75 \times 10^{-7}$/°C. and comprising a flux glass with a composition comprising 25–40% SiO_2, 40–60% PbO, 3–10% ZrO_2, 4–12% B_2O_3 and 0.2–3% Li_2O, and the non-aqueous vehicle comprising a squeegee oil base and a volatile solvent; and

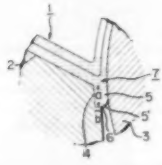
(b) the sprayed coating is applied in a thickness such that the smooth enamel layer does not exceed about 18 microns in thickness.

4,440,811

METHOD FOR COATING AND AN APPARATUS FOR COATING

Yosatomi Hitaka, Hino, and Takemasa Namiki, Iruma, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 157,213, Jun. 6, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 348,078
Claims priority, application Japan, Jun. 13, 1979, 54-73465
Int. Cl.³ B05D *1/26, 1/34*
U.S. Cl. 427—402 **3 Claims**



1. A method for reducing streak defects during the coating of one or more layers of a coating liquid onto a moving substrate from a coating hopper having a coating surface comprising the steps of:

supplying a coating liquid from an efflux end of a coating hopper as a layer;

forming a bead of the supplied coating liquid, said bead bridging the coating hopper and the substrate with part of said bead formed at an entering side of the substrate relative to the efflux end and an end of said bead at the entering side in contact with the hopper;

holding said end of said bead at a liquid end-holding portion of a liquid puddle arranged on the coating hopper, said liquid end-holding portion being formed on said coating surface of the coating hopper by notching said coating surface, said notched coating surface containing an interfering surface substantially perpendicular to the flow of said layer of coating liquid, said interfering surface interfering with the flow of said layer of coating liquid; and

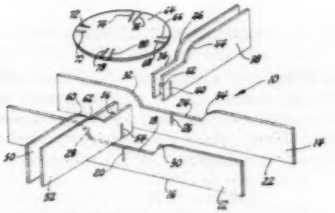
moving the substrate in contact with the coating liquid so that the substrate is coated with the coating liquid.

4,440,812

COLLAPSIBLE CENTERPIECE

Kay L. Norrid, 29772 Robert Dr., Livonia, Mich. 48150

Filed Jul. 19, 1982, Ser. No. 399,442
Int. Cl.³ A47B *3/06*
U.S. Cl. 428—12 **4 Claims**



1. A decorative, collapsible centerpiece, comprising:

a first pair of elongated legs, each leg being formed of a stiff, deformable sheet material, each leg having a lower longitudinal side edge, and an upper longitudinal side edge;

a second pair of elongated legs formed of a stiff deformable sheet material, each leg having a lower longitudinal side edge, and an upper longitudinal side edge;

at least one of said pairs of legs having slot means in its mid-section for receiving the other of said pairs of legs, such that the lower longitudinal side edges of both of said pairs of legs are disposed in a common plane to cooperate to form a self-supporting assembly disposed along their lower longitudinal side edges; and

a planar support formed of a stiff sheet material disposed on the upper longitudinal side edges of both of said pairs of legs, said planar support having slot means in its peripheral edge receiving a portion of each of said legs such that it is separated from the other of said legs.

4,440,813

SCALE MODELLING

Peter Foo, Greenwood Rd., Liverpool, England L18 7HT

Filed Jan. 3, 1983, Ser. No. 455,320
Int. Cl.³ A63H *33/04*; B44F *9/04*
U.S. Cl. 428—15 **11 Claims**

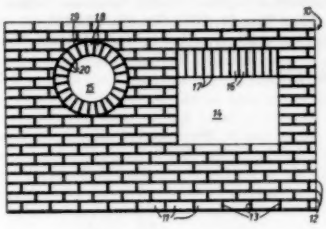
1. A method of modelling walls and like structures comprising the steps of:

(1) representing a strip (30) of bricks from a elongated rectangular cross-sectionally shaped material having transverse slots (31) therein, the spaces between said slots representing bricks or the like;

(2) inserting thin rectangularly shaped strips (32) into the slots (31), so that said strips (32) represent cross joints of a simulated wall;

(3) attaching to the lower surface of strip (30) a thin elon-

gated strip (33) dimensioned for simulating a bed-joint strip of a simulated wall; and



(4) repeating steps (1) through (3) so as to form a simulated wall or like structure.

4,440,814

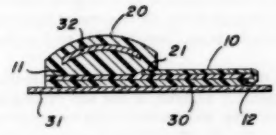
OFFSET TWO-STRIPE DECORATIVE MOLDING

Dennis R. Wolters, Dayton, Ohio, assignor to Protective Treatments, Inc., Dayton, Ohio

Filed Jun. 29, 1982, Ser. No. 393,404

Int. Cl.³ B32B *3/04*; B60R *13/04*

U.S. Cl. 428—31 **6 Claims**



1. An elongated composite molding strip having two laterally offset portions of different character providing a two-stripe appearance comprising, a first adherent elastomer tape having a decorative film positioned to cover one side thereof, a first side margin of said film projecting beyond one side margin of said first tape and being folded thereunder, a decorative molding positioned on the uncovered side of said first tape, one side margin of said molding being coextensive with the other side margin of said first tape and the other side margin of said molding extending over the adjacent side margin of said film, and a second adherent elastomer tape underlying said first elastomer tape and coextensive therewith, said second elastomer tape trapping said folded under side margin of said film and providing an exposed adherent undersurface.

4,440,815

CLEAR, AUTOCLAVABLE PLASTIC FORMULATION FOR MEDICAL LIQUID CONTAINERS

Mostafa Zomorodi, Gurnee, Ill., and Alan J. Trieber, Seabrook, N.H., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 278,253, Jun. 29, 1981, abandoned. This application Sep. 8, 1983, Ser. No. 530,444

Int. Cl.³ C08L *53/02, 53/00, 23/08, 23/12*

U.S. Cl. 428—35 **9 Claims**

1. A clear, flexible, thermoplastic material capable of being processed into hollow shapes by conventional plastic processing methods and subsequently autoclaved comprising:

(a) from about 45% to about 70% by weight of a polyolefin consisting essentially of polypropylene, and copolymers thereof, admixed with,

(b) from about 5 to about 25% by weight of ethylene lower-alkyl acrylate polymers,

(c) from about 10% to about 40% by weight of a thermoplastic elastomer composition consisting essentially of an ethylene butylene block copolymer having terminal polystyrene units, and

(d) from 0 to about 15% of a high boiling point petroleum distillation byproduct.

4,440,816

RUBBER-MODIFIED ASPHALT COMPOSITION

William E. Uffner, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 167,986, Jul. 14, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,729

Int. Cl.³ D06N *7/00*; C08L *95/00*

U.S. Cl. 428—40 **30 Claims**

15. A glass fiber asphalt composite comprising a bundle of glass fibers, said bundle of glass fibers having been impregnated with a non-tacky rubber-modified asphalt, and an adhesive coating on one surface of the impregnated bundle, said adhesive coating comprising an asphalt which has been reacted with (1) a polymerizable vinyl aromatic monomer and (2) a depolymerized rubber.

19. A composite as defined in claim 15 which includes a removable protective strip overlying said adhesive coating.

4,440,817

MEANS FOR AN ELASTIC BODY WITH PROTECTIVE LAYER

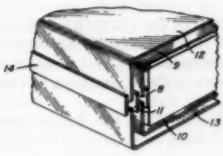
Lars Ahlm, Ulricehamn, Sweden, assignor to Timmele Laminering AB, Ulricehamn, Sweden

Filed Jun. 24, 1982, Ser. No. 391,688

Claims priority, application Sweden, Jul. 3, 1981, 8104154

Int. Cl.³ A47C *27/15*; B32B *3/04, 3/06*

U.S. Cl. 428—71 **9 Claims**



1. An integrated elastic body comprising a predominantly open cell foam plastic core, an inner noise suppressing fabric layer overlying said core and stabilized relative thereto, and an outer non-permeable plastic protective layer overlying said inner layer and unitarily bonded to said inner layer and said core, wherein said body further comprises attachment strips interposed between said core, said inner fabric layer and said outer protective layer, and a covering strip disposed over at least a portion of said outer protective layer.

4,440,818

FLOOR MAT CONNECTOR DEVICE

Walter Buchan, Norton, Mass.; Paul P. Cardin, Woonsocket, and Norman M. Fain, Providence, both of R.I., assignors to Teknor Apex Company, Pawtucket, R.I.

Filed Mar. 30, 1983, Ser. No. 481,051

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—99 **10 Claims**

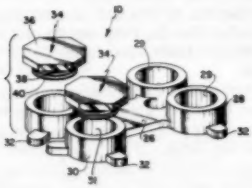
1. A connector device for interconnecting floor mats and the like of the type having a base portion with a plurality of apertures therethrough and a plurality of supporting feet or the like which maintain the base portion in at least slightly upwardly spaced relation to a supporting surface therebeneath, said connector device comprising:

a. a connector body having a thickness not substantially greater than the height of said supporting feet;

b. a first connector element attached to said body and ex-

tending upwardly therefrom into an aperture adjacent the periphery of a first of said mats from the underside of said first mat;

c. a second connector element attached to said body and extending upwardly therefrom into an aperture adjacent the periphery of a second of said mats from the underside of said second mat, said connector body extending between said first and second mats; and



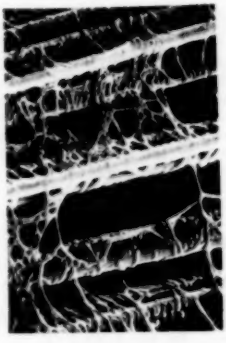
d. a plug element received in said second mat aperture from the upper side of said second mat and attached to said second connector element, at least a portion of said plug element being a greater dimension than said second mat aperture and engaging at least a portion of said second mat base portion to prevent the withdrawal of said second connector element.

4,440,819

INTERCONNECTION OF UNIDIRECTIONAL FIBER ARRAYS WITH RANDOM FIBER NETWORKS

Robin W. Rosser, Santa Monica, and Leon B. Keller, Palos Verdes Estates, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 27, 1982, Ser. No. 453,429
Int. Cl.³ B32B *5/08, 5/10, 5/26, 5/28*
U.S. Cl. 428—107 **21 Claims**



1. A multidirectional fiber array comprising high strength, high modulus unidirectional fibers interconnected with random fiber networks of high strength polymer fibers.

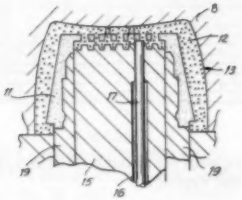
8. A process for preparing a multidirectional fiber array comprising unidirectional fibers, interconnected with high strength polymer fibers, which comprises placing unidirectional fibers in a solution comprising fiber-forming polymeric material in a solvent, and cooling the resultant solution while subjecting it to the application of sonic vibrations.

4,440,820

PLASTIC MOLDING

Masahiko Shibo, Suzaka, and Yasunori Sato, Nagano, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 24, 1981, Ser. No. 334,421
Claims priority, application Japan, Dec. 24, 1980, 55-183491
Int. Cl.³ B32B *3/24*
U.S. Cl. 428—120 **2 Claims**



1. A plastic molding comprising

a first part molding of a determined color having a top and projections formed at said top and defining an enclosed area, said first part molding having a plurality of scattered through holes formed therein, each of said through holes being positioned in a matrix configuration to maintain a predetermined distance between adjacent through holes, at least one of said projections corresponding to at least one of said through holes, all or some of the corresponding through holes being formed within said enclosed area; and

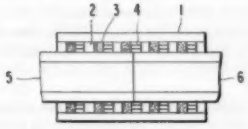
a second part molding of a color different from that of said first part molding adhered to the top of said first part molding including said enclosed area to permit exposure of the face at the end of said one of said projections, said second part molding being adhered to at least one part of said top and back of said first part molding to permit said first part molding to be buried in the plastic material of said second part molding, said plastic material on said top and back being joined together via said through holes, with part of said plastic material on said back being filled in said enclosed area via at least one of said through holes.

4,440,821

HEAT SHRINKABLE MATERIAL

Minoru Komura, and Yasuhiro Moriyama, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Apr. 17, 1980, Ser. No. 141,225
Claims priority, application Japan, Apr. 20, 1979, 54-53774[U]
Int. Cl.³ B32B *3/10*
U.S. Cl. 428—195 **1 Claim**



1. A heat shrinkable material suitable for covering terminals or joints of electric cables and fluid transport pipes consisting essentially of:

(1) a heat shrinkable substrate,

(2) a layer of a first adhesive (A) provided in a dot-, net-, or stripe-like pattern form on one side of the substrate, said

first adhesive (A) being capable of adhering at ordinary temperature and being fluid at ordinary temperature,

(3) a layer of a hot-melt second adhesive (B) provided on the same side of the substrate on certain areas where none of the first adhesive (A) has been coated, said hot-melt second adhesive (B) being incapable of adhering at ordinary temperature but capable of adhering when heated, and

(4) a layer of a third adhesive (C) provided on the same side of the substrate on the areas contiguous to the layer formed by the layer of first adhesive (A) and the layer of hot-melt second adhesive (B) where none of the first adhesive (A) or the hot-melt second adhesive (B) has been coated, said third adhesive (C) being of the thermosetting type.

4,440,822

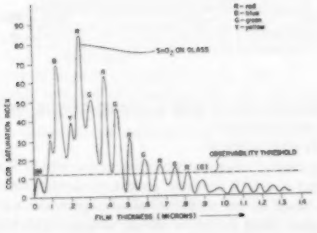
NON-IRIDESCENT GLASS STRUCTURES

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Continuation of Ser. No. 103,509, Dec. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 784,542, Apr. 4, 1977, Pat. No. 4,187,336. This application May 7, 1981, Ser. No. 261,371

Int. Cl.³ B32B *7/02, 17/06*

U.S. Cl. 428—216 **8 Claims**



1. A transparent glass product substantially free of iridescent appearance, having a glass substrate bearing a coating which is substantially uniform across the surface area thereof, said coating consisting of

(a) a lower coating zone comprising a material formed of at least two components which is characterized by a gradual change from a first composition proximate to said substrate having a relatively large proportion of a second component; and

(b) an upper coating zone having a refractive index substantially the same as that of said second component; wherein said lower coating zone is substantially linear with respect to its molecular proporation of said first component, as a function of distance from the glass substrate; wherein said first component is SiO_2, said second component is SnO_2, and said upper coating zone is fluorine-doped tin oxide and wherein said material forming said lower coating zone contains tin oxide in a quantity below 40 percent at the interface of said lower coating zone which is closest to said glass substrate.

4,440,823

PRINTED BOARD FOR ELECTRICAL CIRCUITS

Horst Hoffmann, Höhenkirchen, Fed. Rep. of Germany, assignor to Wilhelm Ruf KG, Munich, Fed. Rep. of Germany

Division of Ser. No. 246,153, Mar. 23, 1981, abandoned. This application Jun. 8, 1982, Ser. No. 386,254

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013667

Int. Cl.³ B32B *3/00, 7/00;* **C23F** *1/02;* **B44C** *1/22*

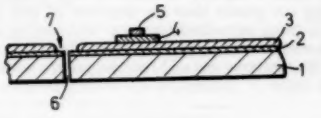
U.S. Cl. 428—209 **1 Claim**

1. A printed circuit board for an electrical circuit, said printed circuit board comprising:

(a) an insulating board;

(b) a copper layer on said insulating board; and

(c) an etch resistant, electrically conducting lacquer layer



covering said copper layer is protected from oxidation by said electrically conducting lacquer layer and its conductivity is enhanced.

4,440,824

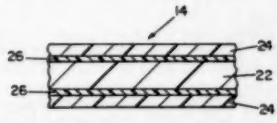
THERMOFORMABLE COEXTRUDED MULTILAYERED STRUCTURE

Laszlo J. Bonis, Swampscott, Mass., assignor to Composite Container Corporation, Medford, Mass.

Continuation-in-part of Ser. No. 314,118, Oct. 23, 1981, abandoned. This application Oct. 4, 1982, Ser. No. 432,421

Int. Cl.³ B65D *5/64;* **B32B** *27/08*

U.S. Cl. 428—216 **12 Claims**



1. A coextruded multilayered structure comprising

a layer of a polyolefin of the group of polyethylene and polypropylene, to provide effective moisture barrier properties,

a layer of high impact polystyrene,

said polystyrene layer providing a printable and heat sealable surface and thermoformability during manufacture, and

an adhesive tie layer between said polystyrene and polyolefin layers,

said tie layer consisting essentially of one of the group of ethylene-vinyl acetate copolymer and polyolefin with acrylic acid additive.

4,440,825

LAMINATE WITH SKIN BASED ON AES GRAFT COPOLYMER

Charles F. Paddock, Southbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,597

Int. Cl.³ B32B *3/26*

U.S. Cl. 428—318.6 **10 Claims**

1. A laminate having at least two layers, one of which comprises an uncured flexible skin layer of AES graft copolymer composition of resin-forming monomeric material on an ethylene-propylene-non-conjugated diene terpolymer rubber spine, and the other layer being a rigid foamed plastic compatible with AES, whereby the laminate is reprocessible.

4,440,826

DECORATIVE SURFACE COVERING

Jack H. Witman, East Hempfield Township, Lancaster County, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jan. 24, 1983, Ser. No. 460,126

Int. Cl.³ B32B *27/14*

U.S. Cl. 428—327 **16 Claims**

1. A decorative surface covering comprising

a backing material,

optionally a design disposed on said backing material, and a thermoplastic coating material disposed on said backing material having translucent or transparent chips embedded therein, the dry thickness of said coating material being not greater than the thickness of said chips, said chips being embedded such that said coating material is extruded from beneath said chips, thereby making said backing material and said optional pattern visible through said chips.

4,440,827

PROCESS FOR PRODUCING RECORDING PAPER FOR INK JET RECORDING AND OPTICAL BAR CODE PRINTING

Shigehiko Miyamoto, Kamagaya, and Yoshinobu Watanabe, Matsudo, both of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 334,380, Dec. 24, 1981, abandoned. This application Feb. 9, 1983, Ser. No. 465,189
Claims priority, application Japan, Dec. 25, 1980, 55-184682
Int. Cl.³ B32B *5/16;* **B05D** *3/02, 3/12;* **G01D** *15/34*
U.S. Cl. 428—327 **13 Claims**

1. A process for producing a recording paper for ink jet recording and optical bar code printing having, on the surface of a support, a coating layer comprising an inorganic pigment and an aqueous polymeric binder characterized by obtaining said coating layer by twice or more repeating a coating step with the same coating color which comprises coating a coating color prepared by mixing 100 parts by weight of said inorganic pigment containing 50–100 parts by weight of synthetic silica with 5–18 parts by weight of said aqueous polymeric binder in an amount of 2–9 g solid/m^2 per one side of the support by one run of coating procedure and then drying the coating color.

10. A recording paper obtained by the process defined by claim 1.

4,440,828

SUBSTRATE FOR A MICROWAVE ELECTRONIC CIRCUIT AND A METHOD FOR THE MAKING OF SAID SUBSTRATE

Jean-Claude Resneau; Pierre Roset, and Jean Doyen, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 14, 1983, Ser. No. 484,994
Claims priority, application France, Apr. 16, 1982, 82 06599
Int. Cl.³ H01M *6/20, 2/16*
U.S. Cl. 428—334 **5 Claims**

1. A substrate for a microwave circuit, comprising a plate comprising fused grains of boron nitride comprising 42% boron, 53.5% nitride, between 1.5 and 2.5% oxygen and 1.5% calcium having two large faces, and a thin glass film deposited at least on one face of said faces, thereby permitting surface metallization of said face and ensuring cohesion of the grains of born nitride wherein said glass film has a dielectric constant substantially equal to the dielectric constant of quartz or of said boron nitride.

4,440,829

COATED BONDING TAPES HAVING IMPROVED PEEL STRENGTH COMBINED WITH LOW TEMPERATURE FLEXIBILITY

Michael J. Gerace, Centerville, and Jeffry D. Adams, Vandalia, both of Ohio, assignors to Protective Treatments, Inc., Dayton, Ohio

Filed Jun. 29, 1982, Ser. No. 393,374
Int. Cl.³ C09J *7/02;* **B60R** *13/00*
U.S. Cl. 428—343 **15 Claims**

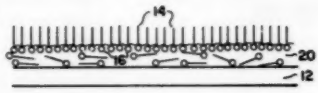
1. A coated bonding tape having improved peel strength combined with low temperature flexibility comprising, a layer of impact-resistant material constituted by a milled layer of pigmented and plasticized elastomer coated with a pressure-sensitive adhesive coating, said elastomer layer having an elastomer component consisting essentially of a mixture of butyl rubbers, pigment and plasticizer for said elastomer sufficient to provide a half thickness reduction at a pressure below 800 psi, at least about 45% of said butyl rubber mixture being cross-linked, at least about 20% of said butyl rubber mixture being noncross-linked with an average molecular weight above about 250,000, and at least about 60% of said pigment having reinforcing character, the proportion of plasticizer providing a tape body having a tensile strength of at least about 30 psi before plastic flow begins, and said pressure-sensitive adhesive coating being selected to provide a bond to said tape body strong enough to force said bonding tape to fail cohesively when peeled from a substrate.

4,440,830

SUBSTRATES COATED WITH RELEASE COMPOSITION BASED ON POLYVINYL ALCOHOL AND COMPOSITES WITH PRESSURE SENSITIVE ADHESIVES

Lawrence K. Wempe, R.D. #1, Center Valley, Pa. 18034

Division of Ser. No. 254,833, Apr. 16, 1981, Pat. No. 4,386,183. This application Oct. 28, 1982, Ser. No. 437,406
Int. Cl.³ C09J *7/02;* **B32B** *9/04*
U.S. Cl. 428—352 **22 Claims**



1. A substrate coated with a release coating composition consisting essentially of:

(a) a polyvinyl alcohol,

(b) a migratable release promoting agent which is a surfactant that in a 10% aqueous polyvinyl alcohol solution at 5 wt.% based on the polyvinyl alcohol provides a dried film on a glass plate having a release value of less than about 0.91 pounds per inch determined by applying a 0.004 inch coating of the surfactant modified polyvinyl alcohol solution to the glass plate, heating the coated glass plate for about 10 minutes at 120° to 125° C. to yield a dried film, applying a strip of masking tape to the film by rolling once with a 4.3 pound roller and pulling an edge of the tape away from the film at a 180° angle,

(c) a water soluble salt of a coordinating metal, and

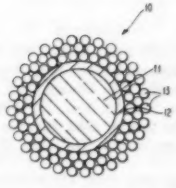
(d) a water soluble boron compound.

4,440,831

ZINC SILICATE PHOSPHOR PARTICLES AND METHOD FOR MAKING THEM

James M. Brownlow, Crompond, and Ifay F. Chang, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 280,147
Int. Cl.³ C09K *11/10, 11/16, 11/20;* **H01J** *29/26*
U.S. Cl. 128—404 **17 Claims**



1. An improved zinc silicate phosphor comprising particles with

an inner core of silicon and oxygen rich material,
an intermediate region rich in manganese oxides, and
an outer portion rich in zinc and oxygen.

8. An improved zinc silicate phosphor comprising particles with
an inner core of silicon and oxygen rich material,
an intermediate region rich in manganese oxides, and
an outer portion rich in zinc and oxygen,
said phosphor having been a product made by the process of:
(a) providing particles of silicic acid to sizes on the order of one micrometer and larger,
(b) mixing said silicic acid particles in an aqueous solution of Mn, Mg and As cations and highly active anions,
(c) adding zinc oxide particles to the result of step (b), drying, and
(d) firing the product of step (c) whereby a reacted oxide product is produced.

4,440,832

METHOD AND MATERIAL FOR PREPARING A SURFACE FOR WINTER SPORTS

Erling O. Wiig, 60 Amigo La., Walnut Creek, Calif. 94596

Continuation of Ser. No. 941,778, Sep. 13, 1978, abandoned. This application Dec. 14, 1979, Ser. No. 103,527

Int. Cl.³ B05D *5/00*

U.S. Cl. 428—405 **12 Claims**

11. A composition of matter useful for providing a winter sports surface, comprising:
a plurality of sodium chloride crystals; and
an aqueous solution of dimethyl silicone, the solution impregnated upon the crystal surfaces and about the crystal lattice structure of substantially each sodium chloride crystal.

4,440,833

COPPER-LAMINATED HARD PAPER MADE OF A FIRE RESISTANT LAMINATE

Arnold Franz, Troisdorf-Spich, and Siegfried Koepnick, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 28, 1982, Ser. No. 437,305

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143121

Int. Cl.³ B32B *27/00, 15/10*

U.S. Cl. 428—425.1 **4 Claims**

1. A copper-laminated hard paper comprising a fire resistant laminate formed of a cellulose-containing substrate material and an impregnating varnish of a phenol-resol with additives of plasticizers and flame retardants, said impregnating varnish having the following composition, by weight:

ammoniacal-condensed phenol-resol resin	35–50%
low-molecular phenolic resin	0–12%
diphenyl cresyl phosphate	20–35%
hexamethylenetetramine	1–6%
tetrabromobisphenol A	0–5%
pentabromodiphenyl ether	0–3%
and a blocked polyetherurethane component comprised of a reaction product of polyethylene glycol, polypropylene glycol and p-nonylphenol with toluene-2,4-diisocyanate having the following composition, by weight	5–20%
polyethylene glycol	15–20%
polypropylene glycol	50–60%
toluene-2,4-diisocyanate	8–12%
nonylphenol	10–15%

3. An impregnating varnish for producing hard paper laminates which contains, by weight:

ammoniacal-condensed phenol-resol resin	35–50%
low-molecular phenolic resin	0–12%

-continued

diphenyl cresyl phosphate	20–35%
hexamethylenetetramine	1–6%
tetrabromobisphenol A	0–5%
pentabromodiphenyl ether	0–3%
and a blocked polyetherurethane component comprised of a reaction product of polyethylene glycol, polypropylene glycol and p-nonylphenol with toluene-2,4-diisocyanate having the following composition, by weight	5–20%
polyethylene glycol	15–20%
polypropylene glycol	50–60%
toluene-2,4-diisocyanate	8–12%
nonylphenol	10–15%

4,440,834

PROCESS FOR THE MANUFACTURE OF TURBINE BLADES COOLED BY MEANS OF A POROUS BODY AND PRODUCT OBTAINED BY THE PROCESS

Jean-Pierre P. A. Aubert, Charenton, and Jacques P. H. Tirole, Sevres, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, S.N.E.C.M.A., France

Filed May 27, 1981, Ser. No. 267,540

Claims priority, application France, May 28, 1980, 80 11769

Int. Cl.³ B22F *5/00*

U.S. Cl. 428—554 **11 Claims**

1. A process for making turbine blades comprising the steps of:
(a) forming a hollow turbine blade such that the ends of the blade are open;
(b) temporarily closing one end of the hollow turbine blade;
(c) placing at least one partition in the hollow blade extending from one end of the blade to the other so as to define separate cavities therein;
(d) filling at least one of the separate cavities with a mixture comprising approximately 85% to 99.5% by weight of chips formed of a base metal chosen from the group consisting of nickel, chromium, tungsten, molybdenum, iron, cobalt, and different alloys of these metals, and approximately 15% to 0.5% by weight of a secondary metal selected from the group consisting of tin, indium, gallium, germanium, antimony, and mixtures and alloys of these metals; and,
(e) heating the assembly sufficiently to fuse the secondary metal to thereby join the metal chips to each other and to the walls of the blade.

8. An air-cooled turbine blade comprising:
(a) a hollow turbine blade formed such that the ends of the blade are open;
(b) means to at least temporarily close one end of the blade;
(c) a partition located within the hollow blade and extending from one end of the blade to the other to divide the blade interior into separate cavities; and
(d) a porous filling located in at least one of the cavities, the filling comprising approximately 85% to 99.5% by weight of chips formed of a base metal selected from the group consisting nickel, chromium, tungsten, molybdenum, iron, cobalt and alloys of these metals, and approximately 15% to 0.5% by weight of a secondary metal selected from the group consisting of tin, indium, gallium, germanium, antimony, and mixtures and alloys of these metals, wherein the secondary metal fuses the chips to each other and to the interior walls of the blade such that the chips define a multiplicity of air channels therebetween.

4,440,835

THIN NON-FLAT GAS ELECTRODE, CURRENT COLLECTOR AND PROCESS OF MANUFACTURE

Rene Vignaud, Aulnay Sous Bois, France, assignor to Societe Les Piles Wonder, Saint Ouen, France

Filed Apr. 13, 1982, Ser. No. 367,993
Claims priority, application France, Apr. 13, 1981, 81 07407; Apr. 13, 1981, 81 07408
Int. Cl.³ H01M *4/88, 4/86*
U.S. Cl. 429—42 **19 Claims**

1. A process for manufacturing an electrode, particularly a thin gas electrode of any non-flat shape, said process comprising preparing a homogeneous mixture of dry particles of active compounds, said homogeneous mixture comprising at least one compound with electrocatalytic activity or at least one compound with electrocatalytic activity and at least one compound presenting electronic conductivity, and dry fibers of polytetrafluorethylene, adding a lubricant or a mixture of a lubricant and a surfactant so as to cause coating of the particles of the mixture with the lubricant, and shaping the lubricated particles of the mixtute so as to form the electrode.

4,440,836

NONAQUEOUS CELL EMPLOYING AN ANODE HAVING A BORON-CONTAINING SURFACE FILM

John C. Bailey, Columbia Station, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 14, 1982, Ser. No. 449,575
Int. Cl.³ H01M *6/16*
U.S. Cl. 429—48 **8 Claims**

1. A nonaqueous cell comprising an active metal anode, a cathode and an ionically conductive electrolyte solution containing a solute dissolved in a nonaqueous solvent and wherein said solute consists of a salt of a first component of a halide of an element selected from the group consisting of Al, Sb, Zr, and P, and a second component of a halide, sulfide, sulfite, oxide or carbonate of calcium or an alkali metal selected from the group consisting of Li, Na, and K; and wherein said active metal anode has a surface layer of a boron-containing material thereon.

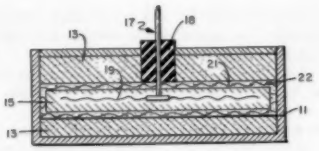
4,440,837

POSITIVE ELECTRODE CURRENT COLLECTOR FOR LIQUID METAL CELLS

Hiroshi Shimotake, Hinsdale, and Louis G. Bartholme, Joliet, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 424,112
Int. Cl.³ H01M *4/52, 6/36*
U.S. Cl. 429—112 **17 Claims**

1. An electrochemical cell comprising a positive electrode including a sulfide, a negative electrode, a molten salt electrolyte including halides of a metal selected from the alkali metals and the alkaline earth metals in contact with both said positive and negative electrodes, said positive electrode having a current collector selected from the group consisting of copper, aluminum and alloys thereof with an iron coating thereon deposited electrolytically on said current collector from an iron chloride bath, whereby said current collector when subjected to cell voltage forming a sulfur-containing compound



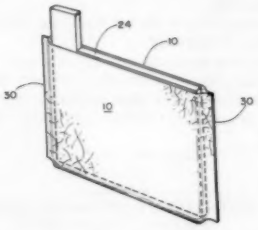
on the surface thereof thereby substantially protecting said current collector from further sulfur ions during cell operation.

4,440,838

LEAD ACID BATTERY, SEPARATOR THEREFOR

George F. Schmidt, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 7, 1982, Ser. No. 385,737
Int. Cl.³ H01M *2/16*
U.S. Cl. 429—250 **9 Claims**



1. A battery separator for physically separating battery plates immersed in a solution of sulfuric acid electrolyte in a lead-acid battery cell, and for holding paste on a grid of a plate of the cell so as to oppose shedding of paste from the surface of the grid, preventing shedded portions of the paste from dropping off the grid and falling to the bottom of the cell as mud, comprising:

(a) a flexible and fibrous polyolefin substrate comprised of a plurality of physically entangled microfibers; and

(b) a wetting composition deposited upon and adhered to external surfaces of said microfibers, said composition comprising of an admixture of:

(1) an epoxy emulsion comprised of:

(i) an epoxy compound,

(ii) a wetting agent, and

(iii) an emulsifier, and

(2) a polyamine curing agent, said emulsion and said curing agent when admixed and cured at a suitable curing temperature providing a crosslinked epoxy compound, said crosslinked compound being characterized by having an insoluble property as well as a hydrophilic property in said electrolyte, said wetting agent being of the type which when immersed in and in contact with said electrolyte solution remains on the fiber and does not dissolve into the electrolyte and yet provides rapid wetting, the crosslinked epoxy compound containing tertiary amine groups, in the form of a polymeric salt, said salt being disposed over the surface of said microfibers after neutralization raising the critical surface tension thereof above that of the electrolyte, thus said raised critical surface tension of said microfibers permitting said electrolyte to wet the salt rapidly, the wetting of said salt being substan-

tially permanent while said separator is immersed in said electrolyte.

4,440,839

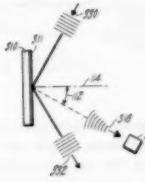
METHOD OF FORMING LASER DIFFRACTION GRATING FOR BEAM SAMPLING DEVICE

Francois M. Mottier, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 244,943, Mar. 18, 1981, abandoned. This application Feb. 22, 1983, Ser. No. 468,614

Int. Cl.³ G03H *1/04, 1/22, 1/26*

U.S. Cl. 430—2 **8 Claims**



1. A method of forming a cross product diffraction grating on a surface of a laser mirror for deflecting a sampled beam of predetermined wavelength from a beam incident on said mirror surface and focusing said sampled beam, comprising the steps of:

generating a zone plate interference pattern for a Gabor-type holographic zone plate, said zone plate pattern having predetermined parameters for focusing deflected radiation at a predetermined position;

generating a linear interference pattern for a first holographic diffraction grating for deflecting a sample beam of optical radiation towards said predetermined position;

forming a cross product interference holographic pattern in a light-sensitive medium by exposing said light-sensitive medium to said interference patterns; and

transferring said cross product holographic interference pattern to said mirror surface, thereby forming said cross product diffraction grating on said mirror surface.

4,440,840

PHOTOGRAPHIC IMAGE-PROCESSING METHOD

Takashi Yamaguchi, Kawasaki, Japan, assignor to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1982, Ser. No. 435,296

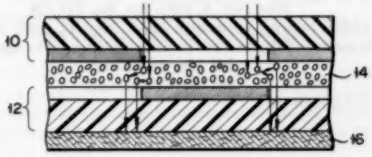
Int. Cl.³ G03F *9/00*

U.S. Cl. 430—4 **5 Claims**

1. A photographic image-processing method to obtain a contour image comprising the steps of:

making positive and negative transparent films;

laying up the positive and negative films with a transparent diffusion film therebetween and with the images of the positive and negative films in registration thereby forming a mask; and



exposing a photosensitive sheet to electro-magnetic waves from above by way of the mask which is placed on the photosensitive sheet.

4,440,841

PHOTOMASK AND PHOTOMASK BLANK

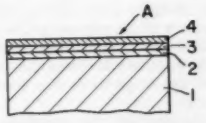
Kazuhiro Tabuchi, Tsurugashima, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Nov. 4, 1981, Ser. No. 318,201

Claims priority, application Japan, Feb. 28, 1981, 56-28721; Feb. 28, 1981, 56-28722; May 7, 1981, 56-68693; May 7, 1981, 56-68694

Int. Cl.³ G03F *9/00*

U.S. Cl. 430—5 **10 Claims**



1. A photomask blank comprising a transparent substrate, a transparent electroconductive film having a thickness between 10 and 1,000 Å comprising a material selected from the group consisting of molybdenum, tantalum, niobium, titanium, chromium, vanadium, tungsten, zirconium, indium oxide and tin oxide, a transparent chemically resistant protective film comprising a material selected from the group consisting of aluminum oxide, calcium oxide, magnesium oxide, silicon oxide, silicon nitride, cerium oxide, titanium oxide, tantalum oxide and chromium oxide and a masking film comprising at least one layer of a masking material selected from the group consisting of chromium, chromium oxide, chromium nitride, silicon, silicon oxide, tantalum, tantalum nitride, tantalum oxide, iron oxide and combinations thereof, said three films being laminated successively on said transparent substrate, said protective film and said masking film selected so that they are different materials and so that the protective film is chemically resistant to an etchant suitable for etching the masking film.

4,440,842

Patent Not Issued For This Number

4,440,843

ELECTROPHOTOGRAPHIC COPYING PROCESS FOR FORMING POSITIVE OR NEGATIVE IMAGES

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

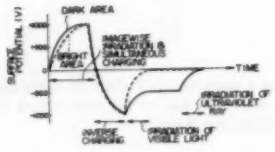
Filed Nov. 9, 1981, Ser. No. 319,328

Claims priority, application Japan, Nov. 12, 1980, 55-158091

The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.

Int. Cl.³ G03G *13/22*

U.S. Cl. 430—55 **4 Claims**



1. An electrophotographic copying process for selectively forming a positive or a negative electrostatic latent image utilizing a photosensitive member for electrophotography which includes a conductive layer carrying a sequential lamination of a first and a second photoconductive layer thereon, the first photoconductive layer having a range of photoconductive response extending over a range of light rays from ultraviolet rays to visible light rays and defined as a first wavelength region, the second photoconductiver layer being sensitive only to ultraviolet rays and defined as a second wavelength region, the process comprising a selective use of:

(a) a step of charging the photosensitive member simultaneously with an irradiation thereof with an image of an original which is formed by raditionin the first wavelength region, followed by an inverse charging until the surface potential of the photosensitive member reaches the same magnitude with an opposite polarity to that in the previous charging step, subsequently followed by a uniform exposure of the photosensitive member to radiation in the first wavelength region to trap a charge in a portion of the photosensitive member corresponding to a dark area of the image to form a positive electrostatic latent image; or

(b) a step of charging the photosensitive member simultaneously with an irradiation thereof with an image of an original which is formed by radiation in the first wavelength region, followed by an inverse charging which reduces the entire surface potential to substantially zero, subsequently followed by a uniform exposure of the photosensitive member to radiation in the second wavelength region to trap a charge in a portion of the photosensitive member corresponding to a bright area of the image to form a negative electrostatic latent image.

4,440,844

ELECTROPHOTOGRAPHIC COPYING PROCESS INVOLVING SIMULTANEOUS CHARGING AND IMAGING

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,428

Claims priority, application Japan, Nov. 12, 1980, 55-158093

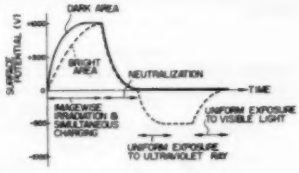
The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.

Int. Cl.³ G03G *13/22*

U.S. Cl. 430—55 **4 Claims**

1. An electrophotographic copying process for selectively forming a positive or a negative copy utilizing a photosensitive member for electrophotography which includes a conductive layer carrying a sequential lamination of a first and a second photoconductive layer thereon, the first photoconductive layer having a range of photoconductive response extending over a range of light rays from ultraviolet rays to visible light rays and defined as a first wavelength region, the second photoconductive layer being sensitive only to ultraviolet rays and defined as a second wavelength region, the process comprising a selective use of:

(A) a step of charging the photosensitive member simultaneously with an irradiation thereof with an image of an original which is formed by radiation in the first wavelength region, followed by an inverse charging which reduces the entire surface potential to substantially zero, subsequently followed by a uniform exposure of the photosensitive member to radiation of the second wavelength region to trap a charge in a portion of the photosensitive



member corresponding to a bright area of the image to form an electrostatic latent image; or

(B) a step of charging the photosensitive member simultaneously with an irradiation thereof with an image of an original which is formed by radiation in the first wavelength region, followed by an inverse charging which reduces the entire surface potential to substantially zero, subsequently followed by a uniform exposure of the photosensitive member to radiation of the first wavelength region to trap a charge in a portion of the photosensitive member corresponding to a bright area of the image to form an electrostatic latent image; and

(C) the step of developing the latent image of (A) or (B) using a toner which is charged with the same polarity for producing a positive copy or a negative copy.

4,440,845

DISAZO COMPOUND, METHOD OF MAKING SAME AND ELECTROPHOTOGRAPHIC ELEMENT USING SAME

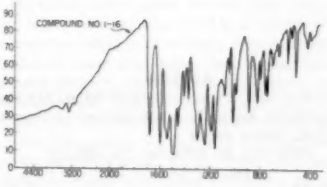
Mitsuru Hashimoto, Numazu, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1982, Ser. No. 385,341

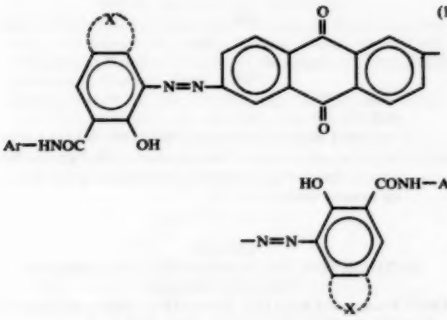
Claims priority, application Japan, Jun. 8, 1981, 56-87845; Jun. 8, 1981, 56-87846

Int. Cl.³ G03G *5/06, 5/14*

U.S. Cl. 430—57 **28 Claims**



1. A multilayer type electrophotographic element comprising a charge carrier generating layer and a charge transfer layer superimposed on an electrically conductive substrate, wherein said charge carrier generating layer contains a disazo compound having the general formula (I):



(I)

wherein X is a substituted or unsubstituted aromatic ring or hetero ring and Ar is a substituted or unsubstituted aromatic ring or hetero ring.

4,440,846

PHOTOCOPY SHEET EMPLOYING ENCAPSULATED RADIATION SENSITIVE COMPOSITION AND IMAGING PROCESS

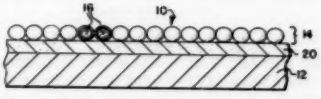
Frederick W. Sanders; Gary F. Hillenbrand; Jonathan S. Arney, and Richard F. Wright, all of Chillicothe, Ohio, assignors to Mead Corporation, Dayton, Ohio

Filed Nov. 12, 1981, Ser. No. 320,643

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.³ G03C *1/40, 1/00*

U.S. Cl. 430—138 **52 Claims**



1. A photosensitive imaging system in which images are formed by image-wise reaction of one or more chromogenic materials and a developer, said system comprising:

a substrate having front and back surfaces,

a chromogenic material,

a radiation curable composition which undergoes an increase in viscosity upon exposure to actinic radiation,

a coating containing said chromogenic material and said radiation curable composition on one of said front and back surfaces, and

a developer material capable of reacting with said chromogenic material to form a visible image,

said radiation curable composition being encapsulated in rupturable capsules as an internal phase,

wherein images are formed by image-wise exposing said coating to actinic radiation and rupturing said capsules in the image areas such that said internal phase is released from said capsules in the image areas and said chromogenic material and said developer react pattern-wise to form an image.

4,440,847

DIAZO MATERIAL WITH WATERBORNE DRAFTING SUBBING COMPOSITION OF ACRYLIC RESIN AND AZIRIDINE AND PROCESS OF USING

Jesse E. Whittemore, Jr., Guilford, Conn., assignor to AM International, Inc., Chicago, Ill.

Filed Aug. 20, 1982, Ser. No. 409,842

Int. Cl.³ G03C *1/76, 1/52, 5/34*

U.S. Cl. 430—146 **5 Claims**

1. A light sensitive imaging member capable of being written on and erased with increased hardness and enhanced adhesion consisting essentially of an oleophilic support substrate, a dried drafting layer coated from a waterborne latex dispersion consisting essentially of the reaction product of an acrylic resin and an aziridine cross-linking agent on at least one surface thereof and a layer of a light-sensitive diazo composition on at least one surface of said drafting layer.

3. An imaging process which comprises providing the light-sensitive imaging member of claim 1, selectively exposing said diazo composition to actinic radiation, and developing said exposed composition to an alkaline environment in the presence of a coupling agent for said diazo composition to produce a visible image.

4,440,848

VINYL-ESTER POLYMERIC TIMING LAYER FOR COLOR TRANSFER ASSEMBLAGES

David B. Bailey, and Edward P. Abel, both of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,501

Int. Cl.³ G03C *1/40, 5/54, 1/76*

U.S. Cl. 430—215 **33 Claims**

1. In a photographic assemblage comprising:

(a) a photosensitive element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material;

(b) a dye image-receiving layer;

(c) a neutralizing layer for neutralizing an alkaline processing composition; and

(d) a timing layer comprising a polymer located between said neutralizing layer and said dye image-receiving layer; the improvement wherein said polymer comprises:

(i) from about 1 to about 30 weight percent of a hydrophilic component comprising a polymerized monovinyl ester of a polybasic acid, and

(ii) the balance comprising a hydrophobic component comprising a polymerized alkyl vinyl ester and a polymerized aryl vinyl ester.

4,440,849

DYE DIFFUSION TRANSFER PROCESS WITH DEVELOPMENT ACCELERATORS

Werner Krafft, Leverkusen, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 21, 1982, Ser. No. 390,262

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125058

Int. Cl.³ G03C *5/54, 1/40, 5/30*

U.S. Cl. 430—239 **4 Claims**

1. A process for the production of colored images by the dye diffusion transfer process in which an imagewise exposed color photographic recording material, comprising at least one photosensitive silver halide emulsion layer and, associated therewith, a non-diffusing color-providing compound, is developed in surface-to-surface contact with an image-receiving layer using a developer preparation containing a development accelerator, wherein the improvement comprises

1. the color photographic recording material used is one which contains, in association with at least one negative silver halide emulsion layer, a combination of a non-diffus-

ing reducible color providing compound and an ED-compound, and

2. the developer preparation used is one which contains, as development accelerator, a combination of two of the compounds A and B or a combination of a compound C with at least one compound of A and B defined in the following of which

A is an aliphatic 1,3-diol selected from the group consisting of 1,3-propane diol, 1,3-butane diol, 2,2-dimethyl-1,3-propane-diol, 2-methyl-2-propyl-1,3-propane diol, 2,2-diethyl-1,3-propane diol, 2-ethyl-1,3-hexane diol, 2-methyl-2,4-pentane diol, 2,2,4-trimethyl-1,3-pentane diol and 1,3-diethyl-2-methyl-1,3-propane diol,

B is 1,4-cyclohexane dimethanol, and

C is phenoxyethanol.

4,440,850

PHOTOPOLYMERISATION PROCESS WITH TWO EXPOSURES OF A SINGLE LAYER

John G. Paul, Falkirk, Scotland; Bernard P. Stark, Great Shelford, England, and Ewald Losert, Rheinfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 12, 1982, Ser. No. 397,373

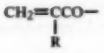
Claims priority, application United Kingdom, Jul. 23, 1981, 8122803

Int. Cl.³ G03C 5/00

U.S. Cl. 430—325 **13 Claims**

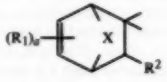
1. A process for production of an image which comprises

(1) exposing to actinic radiation a layer, supported on a carrier, of a liquid composition containing a compound (A) having in the same molecule both at least one group of formula



I

and at least one group of formula



II

such that the layer solidifies and becomes essentially non-tacky due to photopolymerisation of (A) through the group or groups of formula I but remains substantially photocrosslinkable, and subsequently P1 (2) exposing as through an image-bearing transparency consisting of substantially opaque and substantially transparent areas at least part of the layer so solidified to a substantially greater amount of actinic radiation such that the further exposed part or parts of the photopolymerised layer undergo photocrosslinking through the group or groups of formula II, and

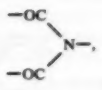
(3) developing the image by dissolving in a solvent parts of the layer which have not become substantially photocrosslinked, where

R denotes a hydrogen atom or a methyl group,

a is zero or an integer of from 1 to 4,

R_1 denotes a methyl group, or, if a is 1, may alternatively denote an allyl group,

R^2 denotes a hydrogen atom, a carboxyl group, a carbonyloxyalkyl group (which may be interrupted in the chain by an ether oxygen atom), a carbonyloxyalkene group joined through an oxygen atom to a group of formula I, the alkyl or alkylene group having up to 8 carbon atoms, or together with one of the indicated free valencies, R^2 denotes a cyclic imide group of structure



and

X denotes a methylene bridge, a methylene bridge substituted by one or two of the aforesaid methyl groups R^1, a methylene bridge substituted by the allyl group R^1, or an oxygen atom.

4,440,851

METHOD FOR THE FORMATION OF A DIRECT POSITIVE IMAGE

Yasuo Tosaka, and Keiji Ogi, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1982, Ser. No. 433,683

Claims priority, application Japan, Oct. 22, 1981, 56-167927

Int. Cl.³ G03C 7/16

U.S. Cl. 430—378 **8 Claims**

1. A method for the formation of direct positive images wherein a silver halide light-sensitive color two silver halide emulsion layers having different spectral sensitivities coated thereon, said silver halide emulsion being an internal latent image type containing unfogged silver halide crystals, comprising imagewise exposing said photographic material and subsequently subjecting said material to an overall area exposure prior to or during the development thereof to form a direct positive image, wherein said overall area exposure is such that the photographic intensity ratios among said silver halide emulsion layers are not more than six, and the intensity of the overall area exposure has a value between a light intensity value yielding 0.8 times the maximum image density of an emulsion layer, and 10 times of said light intensity value, wherein said photographic intensity ratio is the ratio between photographic intensities of two emulsion layers and said photographic intensity is the reciprocal of the intensity value that corresponds to an image density which is 50% of the maximum when an imagewise-unexposed internal latent type silver halide emulsion layer is subjected to light-intensity scale exposure and the density of the image formed by said layer is measured with a light corresponding to the absorption maximum of the image.

4,440,852

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING OXONAL DYES

Akira Onishi, Hachioji, and Noboru Fujimori, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

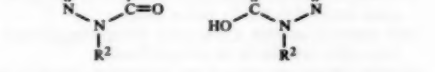
Filed Jun. 14, 1982, Ser. No. 388,131

Claims priority, application Japan, Jun. 25, 1981, 56-99349

Int. Cl.³ G04C 1/84

U.S. Cl. 430—522 **4 Claims**

1. A silver halide photographic light-sensitive material comprising a support and a layer containing an oxonol dye represented by the following formula (1)



(1)

wherein R_1 is a hydrogen atom, fluorine atom, or a fluorinated alkyl group having from 1 to 4 carbon atoms; R_2 is hydrogen, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group; n is an integer of 0, 1 or 2; and L is methine group which may be substituted.

4,440,853

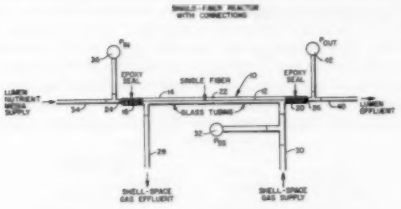
MICROBIOLOGICAL METHODS USING HOLLOW FIBER MEMBRANE REACTOR

Alan S. Michaels, San Francisco; Channing R. Robertson, Stanford, and Stanley N. Cohen, Portola Valley, all of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 179,591, Aug. 21, 1980, abandoned. This application Jun. 20, 1983, Ser. No. 504,599

Int. Cl.³ C12P *1/00, 21/00;* **C12N** *11/00*

U.S. Cl. 435—68 **8 Claims**



1. A method for continuously transforming a substrate to a product by microbiological means employing microorganisms in a flow reactor, said flow reactor comprising:

a housing;

at least one hollow fiber in said housing, said hollow fiber having an inlet port and an outlet port and characterized by having a lumen, a porous membrane surrounding said lumen and having orifices smaller than said microorganisms, said orifices having a maximum diameter of about 0.01 micron, and a spongy supporting wall having asymmetric pores internally communicating through said orifices with said lumen and externally communicating with the volume enclosed by said housing through openings of a size greater than said microorganisms, said openings having a diameter of at least 5 microns; and

a nutrient medium pervading said housing;

said method comprising:

growing microorganisms in said housing under conditions and for a period of time whereby at least 60% of the available volume of said pores in said supporting wall is occupied by said microorganisms at a cell density greater than 10^{12} viable cells/ml., while continually passing substrate containing nutrient medium into said lumen through said inlet port, whereby nutrients and substrate flow into said pores and said substrate is transformed to product by said microorganisms, said product diffusing back through said orifices into said lumen; and

continuously removing nutrient medium containing product from said lumen through said outlet port.

4,440,854

PREPARATION OF 6-DEOXY-D-FRUCTOSE AND 6-DEOXY-L-SORBOSE

George M. Whitesides, 124 Grasmere St., Newton, Mass. 02160; Francois P. Mazenod, 16 Cite Vieusseux, 1203 Geneve, Switzerland, and Chi-Huey Wong, 402 Rindge Ave., Apt. 15F, Cambridge, Mass. 02139

PCT No. PCT/US82/00534, § 371 Date Aug. 30, 1982, § 102(e) Date Aug. 30, 1982

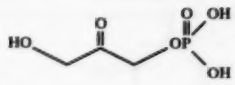
PCT Filed Apr. 23, 1982, Ser. No. 422,070

Int. Cl.³ C12P *19/24, 19/02;* **C07H** *3/08*

U.S. Cl. 435—94 **3 Claims**

1. Process for the preparation of 6-deoxy-D-fructose and/or 6-deoxy-L-sorbose, characterized by the fact that

a. Fructose-1,6-diphosphate or 1,3-dihydroxyacetone phosphate of the formula



is treated with D- and/or L-lactaldehyde in the presence of an enzymatic system composed of aldolase and triose phosphate isomerase in an aqueous medium at pH 7.0, and

b. The monophosphate salt thus obtained is hydrolyzed.

3. Process for the preparation of 6-deoxy-D-fructose and/or 6-deoxy-L-sorbose, characterized by the fact that 1,3-dihydroxyacetone is treated with D- and/or L-lactaldehyde in the presence of an anionic exchange resin.

4,440,855

PROCESS FOR PREPARING L-GLUCOSONE

Robert O. Horwath, Westport, and William J. Colonna, Wilton, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 30, 1982, Ser. No. 393,290

Int. Cl.³ C12P *19/02;* **C12N** *9/04;* **C12R** *1/645, 1/66, 1/69*

U.S. Cl. 435—105 **2 Claims**

1. A process for oxidizing L-glucose to L-glucosone which comprises contacting L-glucuose with glucose-2-oxidase produced by a microorganism selected from the group consisting of genera Polyporus, Aspergillus, Oudemansiella, Radulum, Lenzites, Irpex, Pellicularia, Armillaria, Schizophyllum and Corticium.

4,440,856

PROCESS FOR PRODUCING L-GLUTAMIC ACID

Toshihide Nakanishi, Hofu; Mamoru Kohata, Kawasaki, and Minoru Sakurai, Hofu, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,312

Int. Cl.³ C12P *13/18;* **C12R** *1/13, 1/15;* **C12N** *1/20*

U.S. Cl. 435—111 **11 Claims**

1. A process for producing L-glutamic acid which comprises:

culturing an L-glutamic acid producing mutant microorganism belonging to the genus Corynebacterium or Brevibacterium in a biotin-rich nutrient medium until L-glutamic acid is accumulated in the culture liquor and thereafter recovering said L-glutamic acid therefrom;

said mutant microorganism being temperature-sensitive remediable with an unsaturated higher fatty acid;

said culturing step being carried out, at least in part, at a temperature at which said mutant requires the presence of said unsaturated higher fatty acid for growth or growth comparable to its parent strain at the said temperature; and

said nutrient medium being essentially free of said unsaturated higher fatty acid.

4,440,857

PROCESS FOR PREPARING MYCAROSYLTYLACTONE

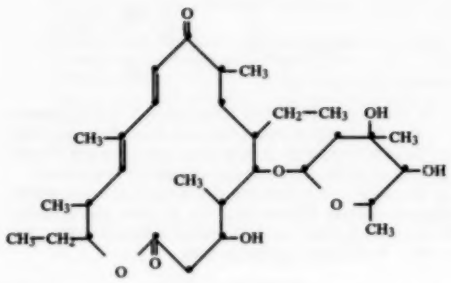
Eugene T. Seno, Norwich, England, and Richard H. Baltz, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 173,313, Jul. 29, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,385

Int. Cl.³ C12P *17/16, 17/08;* **C12R** *1/54*

U.S. Cl. 435—118 **6 Claims**

1. A process for preparing the compound mycarosyltylactone, which has the formula



which comprises cultivating *Streptomyces fradiae* NRRL 12201 or a mycarosyltylactone-producing mutant or recombinant thereof in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of compound is produced and isolating the mycarosyltylactone.

5. The biologically purified culture of microorganism *Streptomyces fradiae* NRRL 12201 or a mycarosyltylactone-producing mutant or recombinant thereof.

4,440,858

PROCESS FOR THE CONTINUOUS PRODUCTION OF ACRYLAMIDE OR METHACRYLAMIDE USING MICROORGANISMS

Yasumasa Yamaguchi; Ichiro Watanabe, and Yoshiaki Satoh, all of Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 2, 1980, Ser. No. 146,937

Claims priority, application Japan, May 2, 1979, 54-53380

Int. Cl.³ C12P *13/02;* **C12N** *11/00, 11/02, 11/04;* **C12R** *1/01, 1/07, 1/13, 1/15, 1/265, 1/365*

U.S. Cl. 435—129 **14 Claims**

1. A process for continuously producing acrylamide or methacrylamide from acrylonitrile or methacrylonitrile by use of a microorganism capable of promoting the hydration reaction of acrylonitrile or methacrylonitrile into the corresponding amide compound,

said process comprising immobilizing the microorganism or enzyme extracted therefrom, continuously bringing the acrylonitrile or methacrylonitrile into contact with the immobilized microorganism or enzyme in at least one reactor containing an aqueous medium at a pH of 6 to 10 to cause the hydration reaction in a reaction solution, and recycling a part of the reaction solution to dilute the unreacted acrylonitrile or methacrylonitrile and water therewith in a ratio of 2 to 100 parts by volume of reaction solution to the volume of acrylonitrile or methacrylonitrile and aqueous medium used to produce said reaction solution.

4,440,859

METHOD FOR PRODUCING RECOMBINANT BACTERIAL PLASMIDS CONTAINING THE CODING SEQUENCES OF HIGHER ORGANISMS

William J. Rutter; Howard M. Goodman; Axel Ullrich; John Shine; John Chirgwin, and Raymond Pictet, all of San Francisco, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 801,343, May 27, 1977, abandoned. This application Sep. 11, 1981, Ser. No. 301,141

Int. Cl.³ C12N *15/00;* **C12P** *21/00, 21/04, 19/34;* **C12N** *1/00*

U.S. Cl. 435—172 **23 Claims**

1. A method for making a microorganism having a gene derived from a higher organism comprising the steps of:

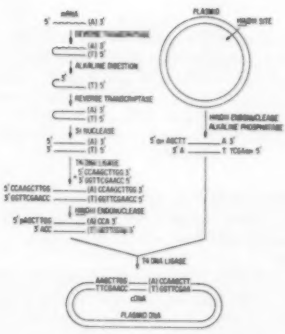
(a) isolating from the higher organism a population of cells containing mRNA, a large proportion of said mRNA having a specific nucleotide sequence and being polyadenylated,

(b) extracting the mRNA from the population of cells under conditions which prevent RNase degradation of the mRNA,

(c) separating polyadenylated mRNA substantially free of protein, DNA and other RNA,

(d) synthesizing a double stranded cDNA wherein one strand has a nucleotide sequence complementary to that of the polyadenylated mRNA,

(e) attaching a polynucleotide having a sequence, containing the recognition site for a restriction endonuclease, to both ends of the cDNA,



(f) incubating the cDNA having recognition site sequences at both ends with a restriction endonuclease capable of acting at the recognition site, in order to produce cohesive ends on the cDNA,

(g) providing a plasmid DNA having cohesive ends complementary to the cohesive ends of the cDNA, said plasmid DNA cohesive ends having 5′ hydroxyl termini, whereby covalent ring closure of the plasmid DNA is prevented in the absence of added cDNA,

(h) mixing the cDNA and the plasma DNA together in order to form a cDNA-plasmid recombinant, and

(i) mixing a microorganism together with the cDNA plasmid recombinant in order to transform the microorganism, and

(j) thereby transferring to the said microorganism the gene derived from a higher organism.

4,440,860

STIMULATING CELL GROWTH

Michael Klagsbrun, Newton, Mass., assignor to The Children's Medical Center Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 113,229, Jan. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 953,491, Oct. 23, 1978, abandoned. This application Mar. 2, 1981, Ser. No. 239,523

Int. Cl.³ C12N *5/00, 5/02;* **C12M** *3/00, 3/04*

U.S. Cl. 435—240 **33 Claims**

1. A cell culture medium comprising mammalian milk and fibronectin.

4,440,861

SOLAR APPARATUS AND PROCESS

Walton W. McCarthy, Bozeman, Mont., assignor to Entropy Dynamics, Bozeman, Mont.

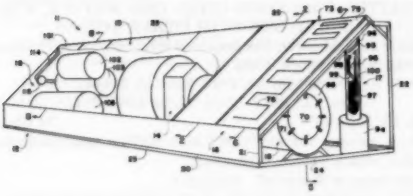
Continuation-in-part of Ser. No. 187,348, Sep. 15, 1980, Pat. No. 4,345,974. This application Oct. 1, 1981, Ser. No. 307,610

Int. Cl.³ B01D *3/00;* **C07C** *29/80;* **C12C** *7/08;* **C12M** *1/02*

U.S. Cl. 435—306 **1 Claim**

1. Solar apparatus for producing alcohol including a frame portion, a heating portion, a slurry-forming portion, a fermen-

tation portion, a distillation portion, a condensation portion and a drying portion; said frame portion including a base section having a length substantially greater than the width thereof, upstanding sections extending upwardly from each longitudinal ege of said base section, one of said upstanding sections having a height substantially greater than the other upstanding section; said heating portion including a plurality of solar panel members, said panel members being disposed adjacent to one another, said panel members extending between said upstanding sections of said frame portion; said slurry-forming portion being disposed below said heating portion and including hammer mill means and a frustoconical section thereunder, said frustoconical section including a tangential liquid inlet opening and a tangential slurry outlet opening; said fermentation portion being disposed below said heating portion and including a fermentation chamber, pump means disposed adjacent said chamber, an inlet conduit extending between said pump means and the bottom of said chamber, an outlet conduit extending downwardly from said pump means and adjacent



the bottom of said chamber and having a plurality of discharge openings therealong; said distillation portion including a solar panel member extending between said upstanding sections, said solar panel member including a base section and a face section, said face section including a conduit having a circuitous path, transparent layers over said face section, distributing means disposed under the lower end of said face section, a plurality of spaced baffle means extending from said face section to said base section; said condensation portion being disposed below said distillation portion and including a first chamber, a second chamber extending downwardly within said first chamber partway down from the top, a spiral conduit disposed within said first chamber and communicating with the lower end of said second chamber; said drying portion including a solar air heating section disposed adjacent to said heating portion, a solids storage means, a rotatable cylindrical member horizontally disposed below said solar heating section, liquid collecting means disposed below said cylindrical member, and liquid storage means associated with said collecting means.

4,440,862

METHOD OF DETERMINING CORROSION PROPERTIES OF ZIRCONIUM ALLOYS

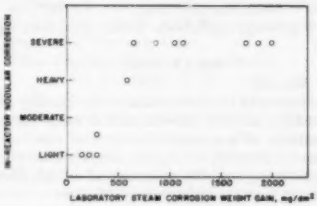
Bo-Ching Cheng, and Ronald B. Adamson, both of Fremont, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Oct. 30, 1981, Ser. No. 316,757
Int. Cl.³ G01N *17/00*
U.S. Cl. 436—6 **10 Claims**

1. A method of determining the relative resistance to nodular-type of corrosion of an alloy of zirconium in an environment of a water cooled nuclear fission reactor, comprising exposing a specimen of the alloy to high pressure steam sequentially applied at two distinct temperature levels by applying the steps of:

(a) subjecting a specimen of an alloy of zirconium to an atmosphere of steam at a temperature of about 300° to about 420° C. at a pressure of at least about 1000 psig for a period of at least about 5 hours;

(b) thereupon subjecting the specimen of an alloy of zirconium at an atmosphere of steam at a temperature of about 490° to about 520° C. at a pressure of at least about 1000 psig for a period of at least about 12 hours; and



(c) ascertaining any corrosion formation on said steam exposed specimen of alloy of zirconium.

4,440,863

BREAST CYST FLUID PROTEIN ASSAY

Darrow E. Haagensen, Jr., Newtonville, Mass., assignor to Duke University, Durham, N.C.

Continuation-in-part of Ser. No. 102,095, Dec. 10, 1979, which is a division of Ser. No. 880,257, Feb. 22, 1978, Pat. No. 4,229,426.
This application Aug. 13, 1981, Ser. No. 292,369
Int. Cl.³ G01N *33/54, 33/58, 33/60;* C07C *7/00*
U.S. Cl. 436—539 **5 Claims**

1. A method useful in determining the maturity of a fetus which method comprises determining the concentration of the glycoprotein gross cystic disease fluid protein-15 (GCDFP-15) in an amniotic fluid sample by conducting an immunoassay for said glycoprotein in said amniotic sample utilizing a GCDFP-15 selective antibody and GCDFP-15 labelled with a unique and detectable label to produce an antigen-antibody reaction product, separating said product from the said reagents and determining the concentration of GCDFP-15 in the amniotic fluid sample by detecting the quantitative value of said label in either said reaction product or said reagents and comparing said label value to a standard curve whereby the concentration of GCDFP-15 in said amniotic fluid is directly correlatable to the maturity of said fetus after about 24 weeks of gestation wherein said GCDFP-15 is characterized as follows:

(a) a glycoprotein having a calculated monomer size of about 15,000 daltons as determined by sodium dodecyl sulfate acrylamide gel analysis; and

(b) immunologically not identical to any components of plasma as determined by Ouchterlony analysis; and

(c) immunological cross identity with a component of human milk and human saliva; and

(d) cleavage with cyanogen bromide provides two peptides one of which is blocked, and one of the peptides has a molecular weight of about 12,500 daltons as determined by sodium dodecyl sulfate acrylamide gel analysis and having the following partial sequence of amino acids:

10
H_2N—Val-Val-Lys-Thr-Tyr-Leu-Ile-Ser-Ser-Ile-Pro-Leu
20
Gln-Gly-Ala-Phe-Asn-Tyr-Lys-Tyr-Thr-Ala-(Cys)-Leu-(Cys)-
30 39
Asp-Asp-Asn-Pro-Lys-Thr-Phe-Tyr-Trp-Asp-Phe-Tyr-Thr-(Gln)-

( ) indicate possible derivitization.

4,440,864

CHEMICALLY BONDABLE FOUNDRY SAND

John Campbell, Worcester, England, assignor to Cosworth Research and Development Limited, Worcester, England

Filed Mar. 19, 1982, Ser. No. 359,923

Claims priority, application United Kingdom, Apr. 1, 1981, 8110234

Int. Cl.³ C04B 35/80

U.S. Cl. 501—95 7 Claims

1. A chemically bondable reclaimable foundry sand mixture for fabricating cores or moulds used in metal castings consisting essentially of a granular mixture of sand, organic resin binder and a plurality of organic fibres intimately mixed and dispersed throughout the mixture and which fibres increase resistance to fracture and breakage of cores or moulds used in metal castings, whereby a core or mould prepared from said sand mixture is physically strong and handleable and relatively unbreakable during metal casting but which core or mould is easily reclaimed from said sand mixture by resin burn-off procedures.

4,440,865

REFRACTORY COMPOSITIONS AND METHOD

Paul V. Salazar, 1506 Clinton Pl., River Forest, Ill. 60305

Division of Ser. No. 355,320, Mar. 8, 1982. This application Aug. 31, 1983, Ser. No. 527,979

Int. Cl.³ C04B 35/10, 35/18, 35/80

U.S. Cl. 501—95 20 Claims

1. A refractory composition having an increased shelf life comprising:

Aluminum phosphate	5–70%;
A refractory material selected from the group consisting of alumina, aluminum silicate, and mixtures thereof	2–94%; and
Phosphoric acid	1–10%.

4,440,866

PROCESS FOR THE PRODUCTION OF SINTERED BAUXITE SPHERES

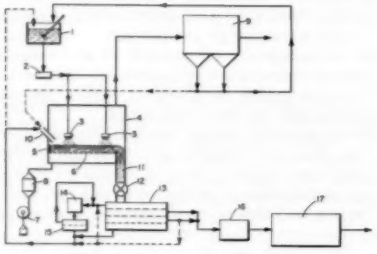
Eugene P. Lunghofer, Youngstown, N.Y.; Sten Mortensen, and Aubrey P. Ward, both of Columbia, Md., assignors to A/S Niro Atomizer, Soeborg, Denmark

Continuation-in-part of Ser. No. 278,356, Jun. 29, 1981, abandoned. This application Oct. 28, 1982, Ser. No. 437,321

Claims priority, application United Kingdom, Jul. 7, 1980, 8022175; Denmark, Jul. 1, 1982, 36/82

Int. Cl.³ C04B 35/16

U.S. Cl. 501—127 9 Claims



1. A process for the production of sintered bauxite spheres, suitable for use as fracture propping agent in oil wells, comprising the steps of

(a) preparing an aqueous feed suspension comprising bauxite and a binder,

(b) continuously atomizing said feed suspension into a layer of already partly dried bauxite particles fluidized in a stream of drying air,

(c) continuously recovering particles from said layer

(d) continuously separating said recovered particles in oversize, undersize and product fractions making allowance for shrinkage in the subsequent sintered operation,

(e) continuously recycling material selected from the group consisting of undersize fractions, relative fine product fractions, ground product fractions and ground oversize fractions, to the layer of fluidized particles at a site at substantial distance, measured along the flow path of the particles, from the site where said recovering of particles takes place, and

(f) drying and sintering the non-recycled product fractions by heating them at a temperature between 1200° and 1650° C.

4,440,867

CALCINED, HIGH SURFACE AREA, PARTICULATE MATTER, PROCESSES USING THIS MATTER, AND ADMIXTURES WITH OTHER AGENTS

Inderjit H. Sabherwal, Los Angeles, Calif., assignor to Ensotech, Inc., N. Hollywood, Calif.

Filed May 14, 1982, Ser. No. 378,081

Int. Cl.³ B01J 39/02, 39/04; C02F 1/42

U.S. Cl. 502—62 34 Claims

1. A process for producing high surface area particulate matter, which process comprises:

calcining, a charge of

feed particulate matter selected from the group consisting of clay mineral, feldspar, zeolite, coal ash, fly ash, pozzolan and volcanic ash,

at a temperature above about 1100° C.,

for a time sufficient to develop fractures extending from the surface of the calcined particulate matter,

which fractures increase substantially the surface area of the calcined particulate matter over the surface area of said feed particulate matter.

4,440,868

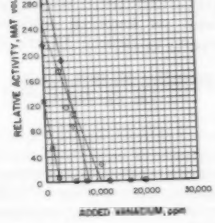
CARBO-METALLIC OIL CONVERSION CATALYSTS

William P. Hettinger, Jr.; Hubert W. Beck, both of Russell, and Stephan M. Kovach, Ashland, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 7, 1981, Ser. No. 328,354

Int. Cl.³ B01J 29/06

U.S. Cl. 502—65 12 Claims



1. A composition of matter of fluidizable solid catalyst particles comprising in combination,

(a) from 35 to 60 weight percent of a crystalline zeolite comprising a La/Ce ratio greater than 1/1 and a silica/alumina ratio of at least 4.5 dispersed in a matrix composition comprising clay particles of about 1 micron

size and a refractory metal oxide of gelacious or colloid ancestrary,

(b) the zeolite, clay, refractory metal oxide materials of step (a) each initially comprising less than 0.25 weight percent of sodium, and

(c) a spray dried product of a mixture of step (a) providing fluidizable catalyst particles of a pore volume in the range of 0.35 cc/g up to about 0.8 cc/g.

10. A catalyst particle composition comprising in combination;

(a) at least 40 weight percent of a high activity crystalline aluminosilicate of large pore size dimensions such as provided by mordenite, zeolite "L", ZSM4, gmelinite and faujasite, ion exchanged sufficiently to provide a greater than 3/1 lanthanum to cerium ratio exchanged zeolite of less than 0.25 weight percent sodium,

(b) said ion exchanged crystalline aluminosilicate admixed with a matrix composition comprising a clay material treated with an acidic modifier and a silica sol containing refractory material,

(c) said matrix material of a composition providing a pore volume of at least about 0.40 cc/g, and

(d) spray dried particles of the composition of (b) ion exchanged and dried to provide excess lanthanum in the particle composition.

4,440,869

OLEFIN POLYMERIZATION CATALYST

Mark L. Shannon, and Mark P. Mack, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Sep. 30, 1982, Ser. No. 429,632
Int. Cl.³ C08F *4/64, 4/68, 4/62*
U.S. Cl. 502—104 **9 Claims**

1. A method for preparing catalysts for polymerization of alpha-olefins comprising contacting, in substantial absence of proton donor, a soluble magnesium compound of the general formula

$Mg(OSiR_3)_2$ with transition metal tetraalkoxide of the general formula $M(OR^1)_4$ in a saturated aliphatic hydrocarbon solvent to form a solution, then forming a precipitate by chlorinating the solution in the substantial absence of free oxygen and recovering the precipitate for use as a catalyst, wherein each R is, independently, alkyl groups or alkoxy groups containing from 1 to about 20 carbon atoms or aryl, aryloxy groups, cycloalkoxy groups or cycloalkyl groups containing from 6 to 14 carbon atoms and each R^1 is independently, alkyl groups or etherically substituted alkyl groups containing from 1 to 20 carbon atoms, aryl, cycloalkyl or etherically substituted aryl or cycloalkyl groups containing from 6 to 14 carbon atoms and M is titanium, vanadium, chromium or zirconium.

4,440,870

NOVEL BORATE CATALYST SYSTEMS

John R. Sanderson; Lewis W. Watts, Jr., and Walter H. Brader, Jr., all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,661
Int. Cl.³ B01J *21/02*
U.S. Cl. 502—207 **3 Claims**

1. A catalyst system of at least two transition metal borates comprising

a. a transition metal borate where the transition metal is taken from the group consisting of Group IVB and Group VB of the Periodic Table, and

b. a transition metal borate where the transition metal is taken from Group VIII of the Periodic Table.

4,440,871

CRYSTALLINE SILICOALUMINOPHOSPHATES

Brent M. Lok, New City; Celeste A. Messina, Ossining; Robert L. Patton, Katonah, all of N.Y.; Richard T. Gajek, New Fairfield, Conn.; Thomas R. Cannan, Valley Cottage, and Edith M. Flanigen, White Plains, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 26, 1982, Ser. No. 400,438
Int. Cl.³ B01J *27/14*
U.S. Cl. 502—214 **38 Claims**

1. Microporous crystalline silicoaluminophosphates the pores of which are uniform and have nominal diameters of greater than about 3 Angstroms and whose essential empirical chemical composition in the as-synthesized and anhydrous form is

$$mR:(Si_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" has a value of from 0.02 to 0.3; "m" represents the moles of "R" present per mole of $(Si_xAl_yP_z)O_2$; "x", "y" and "z" represent the mole fractions of silicon, aluminum and phosphorus respectively, present as tetrahedral oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points ABCD and E of the ternary diagram which is FIG. 1 of the drawings.

4,440,872

TRANSITION METAL OXIDE ACID CATALYSTS

Dane C. Grenoble, Baton Rouge, La.; Chang J. Kim, Somerset, and Lawrence L. Murrell, South Plainfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 203,140, Nov. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 82,316, Oct. 5, 1979, Pat. No. 4,269,737, which is a continuation-in-part of Ser. No. 927,829, Jul. 25, 1978, abandoned. This application Dec. 18, 1981, Ser. No. 332,214
Int. Cl.³ B01J *21/12, 23/30*
U.S. Cl. 502—242 **31 Claims**

1. A solid acid catalyst comprising at least one catalytic metal oxide component wherein said catalytic metal is selected from the group consisting of (a) tungsten, niobium and mixtures thereof and (b) mixtures of (a) with tantalum, hafnium, chromium, titanium, zirconium and mixtures thereof wherein said catalytic metal oxide component is supported on a silica-containing inorganic refractory metal oxide support, the silica content of which is less than 50 wt.% of said support calculated as SiO_2, said catalyst being steamed prior to use at a temperature above about 600° C.

4,440,873

PROCESS FOR PRODUCING ETHYLENE GLYCOL AND/OR GLYCOLIC ACID ESTER, CATALYST COMPOSITION USED THEREFOR, AND PROCESS FOR PRODUCTION THEREOF

Haruhiko Miyazaki; Taizo Uda; Koichi Hirai; Yasuo Nakamura, all of Ube; Harumi Ikezawa, Onoda, and Takanori Tsuchie, Ube, all of Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Apr. 21, 1982, Ser. No. 370,555
Claims priority, application Japan, Apr. 30, 1981, 56-64015
Int. Cl.³ B01J *23/72, 37/18*
U.S. Cl. 502—244 **8 Claims**

1. A hydrogenation catalyst composition useful for the hydrogenation of an oxalate diester, said composition being composed of a reduction product of copper-containing silica gel formed by contacting an ammine complex of copper with colloidal silica sol.

4,440,874

CATALYST COMPOSITION AND METHOD FOR ITS MANUFACTURE

Charles E. Thompson, Warren, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Filed Apr. 14, 1982, Ser. No. 368,185
Int. Cl.³ B01J 21/04, 23/58, 23/78
U.S. Cl. 502—327 15 Claims

1. A catalyst composition comprising a carrier on which are carried:

(a) a refractory metal oxide support;

(b) a catalytically effective amount of a platinum group metal component; and

(c) a catalytically enhancing amount of an oxide composite comprising at least one of magnesium ferrite, calcium ferrite, strontium ferrite, and barium ferrite.

4,440,875

CATALYTIC PROCESS FOR THE PRODUCTION OF HYDROCARBONS FROM SYNGAS

Andras G. T. G. Kortbeek; Guy Barre, and Jean M. Durel, all of Grand Couronne, France, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 16, 1982, Ser. No. 408,382
Claims priority, application France, Sep. 28, 1981, 81 18208
Int. Cl.³ C07C 1/04
U.S. Cl. 518—728 7 Claims

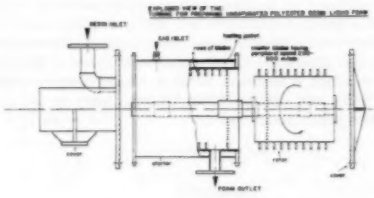
1. A process for the selective production of C_4 hydrocarbons from synthesis gas, wherein the synthesis gas is passed at conversion conditions of elevated pressure and temperature over a catalyst consisting of zirconium oxide promoted with at least one alkali metal compound.

4,440,876

LIQUID FOAMS OF REINFORCED UNSATURATED POLYESTER RESINS AND PROCESS FOR MAKING THE SAME

Massimo Mazzola, Segni, and Aldo Cipriani, Colleferro, both of Italy, assignors to SNIA VISCOSA S.p.A. Societa Nazionale Industria Applicaziono Viscosa, Milan, Italy

Continuation-in-part of Ser. No. 145,251, Apr. 30, 1980. This application Jan. 13, 1983, Ser. No. 457,632
Int. Cl.³ C08J 9/30
U.S. Cl. 521—123 7 Claims



1. A continuous process for making fiber-reinforced foams which are suitable for transforming into reinforced solid cellular materials having a density lower than 0.7 kg/l if no inert filler material is present or a density lower than 1 kg/l if inert fillers are present as well, said process essentially comprising:

(1) mixing together an unsaturated polyester resin, a reinforcing material and, optionally an inert filler, said reinforcing material being selected from the group consisting of synthetic fibers, vegetable fibers and mineral fibers having a maximum length of 3 mm, whereby a liquid mixture is obtained;

(2) transferring said liquid mixture of reinforcing material, unsaturated polyester resin and, optionally, said inert filler to a turbine having a free internal volume of at least 2 liters and comprising a rotor and a stator, both having either prismatic or cylindrical projections, said turbine rotor having a peripheral speed of greater than 200 m/min and; thereafter

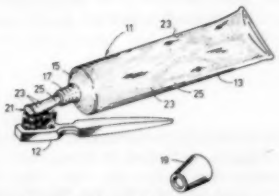
(3) introducing a gas into said turbine at a pressure of from 1.1 to 10 absolute atmospheres, said turbine operating to distribute said gas in the form of small bubbles homogeneously and uniformly throughout said mixture, thereby producing a reinforced foam of unsaturated polyester resin, and thereafter discharging said reinforced foam from said turbine.

4,440,877

FUNCTIONAL AGGLOMERATED SPECKLES AND METHODS FOR MANUFACTURING SUCH SPECKLES

John P. Hauschild, Bridgewater, and Joseph R. Principe, East Brunswick, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 307,272, Sep. 30, 1981, Pat. No. 4,376,762. This application Aug. 30, 1982, Ser. No. 413,194
Int. Cl.³ A61K 7/16
U.S. Cl. 523—105 10 Claims



1. Functional agglomerated speckles, for incorporation in dentifrices, which comprise agglomerates of a water insoluble powdered functional material, a water insoluble, ethanol soluble ethyl cellulose binder, and a water soluble binder.

4,440,878

RESIN-FORMING MATERIAL, IMPLANT MATERIAL AND COMPOSITIONS FOR RESTORATIVE MATERIAL SUITABLE FOR MEDICAL OR DENTAL USE

Haruyuki Kawahara, Moriguchi; Teruo Makita, Kobe; Shozo Kudo, Minoo, and Takashi Funakoshi, Osaka, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

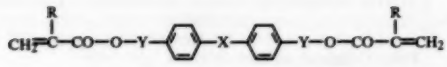
Continuation of Ser. No. 138,814, Apr. 9, 1980, Pat. No. 4,327,014. This application Jan. 20, 1982, Ser. No. 340,687
Claims priority, application Japan, Apr. 11, 1979, 54-44752; Apr. 11, 1979, 54-44753
The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.
Int. Cl.³ C08K 3/28
U.S. Cl. 523—116 9 Claims

1. A dental filling material, consisting essentially of:

(A) from about 50 to about 95% by weight of finely divided, inorganic filler material which is safe and effective for use in a dental filling in the human body, wherein at least 50% by weight of said filler material is at least one nitride substance having a Moh's hardness of at least 7 and is selected from the group consisting of vanadium nitride, boron nitride, aluminum nitride, silicon nitride, titanium nitride and zirconium nitride, and the balance of said filler material is one or more inorganic dental filler substances which are different from said nitride substance, having a Moh's hardness of at least 5 and are useful as a filler for dental filling materials, and

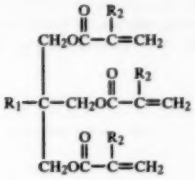
(B) from about 50 to about 5% by weight of polymerizable monomer component capable of polymerizing to form a binder resin for dental filling materials, said polymerizable monomer component being selected from the group consisting of

(1) monomers having the formula



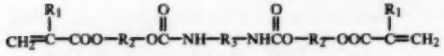
wherein R is hydrogen or methyl, X is alkylidene and Y is oxyalkylene having from 2 to 5 carbon atoms,

(2) monomers having the formula



wherein R_1 is CH_3, CH_3CH_2 or $CH_3CH_2CH_2$, and R_2 is H or CH_3,

(3) monomers having the formula



wherein R_1 is hydrogen or methyl, R_2 is alkylene and R_3 is a divalent hydrocarbon group,

(4) neopentylglycol dimethacrylate,

(5) triethyleneglycol dimethacrylate,

(6) bisphenol A diglycidyl methacrylate, and mixtures thereof.

4,440,879

PROCESS FOR PREPARING FILLER-CONTAINING POLYTETRAFLUOROETHYLENE FINE POWDER

Shoji Kawachi, Nishinomiya; Katsutoshi Yamamoto, Settsu, and Shinichiro Kai, Ibaraki, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 18, 1981, Ser. No. 235,622

Claims priority, application Japan, Feb. 21, 1980, 55-18724

Int. Cl.[3] **C08K** *3/24;* **C08L** *27/18, 27/20*

U.S. Cl. 523—200 **9 Claims**

1. A process for preparing filler-containing polytetrafluoroethylene fine powder, comprising the steps of: mixing together an aqueous dispersion containing 5 to 50% by weight of particles of polytetrafluoroethylene having an average particle size of from about 0.1 to 0.3μ and an aqueous dispersion containing 1 to 120 parts by volume based upon 100 parts by volume of aqueous medium of filler particles having an average particle size of from 0.001 to 200μ adsorbed with polyvalent cations selected from the group consisting of aluminum ions, iron ions, magnesium ions, calcium ions, barium ions, copper ions and zinc ions at the surface thereof so as to be charged positively in the presence of an anionic surfactant and 30 to 100 parts by weight to 100 parts by weight of the solid components of a water-immiscible liquid having a boiling point of 30° to 150° C. and a surface tension of not more than 35 dyne/cm to coagulate the polytetrafluoroethylene particles and the filler particles in combination, wherein the amount of the filler is from 5 to 60% by volume to the volume of polytetrafluoroethylene and the content of the filler in the aqueous dispersion is from 1 to 120 parts by volume based upon 100 parts by volume of aqueous medium; and recovering the coagulated particles from the resultant dispersion mixture, said filler particles being per se negatively chargeable in water.

4,440,880

PROCESS FOR STABILIZING BY ENCAPSULATION RED PHOSPHORUS TO BE USED AS FLAME RETARDANT OF POLYMERIC MATERIALS AND PRODUCT SO OBTAINED

Giancarlo Albanesi, and Gianfranco Rinaldi, both of Milan, Italy, assignors to Saffa S.p.A., Milan, Italy

Filed Oct. 22, 1981, Ser. No. 314,049

Claims priority, application Italy, Nov. 19, 1980, 26064 A/80

Int. Cl.[3] **C08K** *3/02, 9/10;* **C08L** *61/28*

U.S. Cl. 523—205 **18 Claims**

1. A process for stabilizing red phosphorus powder, in its various allotropic forms, by encapsulating the particles of said powder in a malamine resin for its safe use as a flame retardant of polymeric materials, which comprises the steps of:

(a) preparing an aqueous solution of a melamine condensate cationized with a mineral acid by reacting in an aqueous medium melamine, formaldehyde, triethanolamine, and an aliphatic monohydroxyl alcohol having up to 5 carbon atoms, in the respective percent by weight ratios: 25.27% to 21.62%, 36.04% to 30.85%, 29.87% to 25.57% and 8.82% to 21,96%, and adjusting the pH thereof with the mineral acid;

(b) forming a hydrodispersion of the solution formed in step (a) by dispersing red phosphorus powder directly therein;

(c) heating said hydrodispersion, under stirring, at 80° to 100° C. to encapsulate individual particles of the red phosphorus powder by precipitating onto said individual particles of red phosphorus powder, said melamine condensate to form a continuous and compact layer of an insoluble, partially cross-linked melamine resin; and

(d) subsequently drying the insoluble, partially cross-linked layer of melamine resin in an inert gas stream at 80° to 130° C. to obtain a cross-linked melamine resin-encapsulated red phosphorus powder suitable for easy and safe dispersion in polymeric materials, said layer of melamine resin which encapsulates said red phosphorus powder amounting to 0.1 to 30% by weight of the red phosphorus powder.

16. A self-extinguishing polymeric composition which includes 3% to 15% by weight of the red phosphorus powder encapsulated with melamine resin according to the process defined in claim 1.

4,440,881

AQUEOUS, ADHESIVE COATING COMPOSITION WITH A NON-SELFCROSSLINKABLE ELASTOMER FOR USE WITH FILAMENTARY MATERIALS

Mikhail M. Girgis, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 324,750, Nov. 25, 1981, which is a continuation-in-part of Ser. No. 238,725, Feb. 27, 1981, Pat. No. 4,405,746. This application Sep. 29, 1982, Ser. No. 426,593

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.[3] **C08L** *61/12;* **B32B** *25/02, 27/04*

U.S. Cl. 523—206 **29 Claims**

1. Filamentary material coated with an aqueous adhesive coating composition, wherein the aqueous coating composition comprises:

(1) at least three elastomeric materials, where the total gel content of the coating composition attributable to the elastomeric materials is less than about 70 weight percent based on the aqueous coating composition, wherein the three elastomeric materials are:

A. A vinyl-pyridine-containing elastomeric latex selected from the group consisting of an elastomeric copolymer latex produced from a vinyl pyridine-containing monomer and 1,3-diene hydrocarbon monomer and an elastomeric terpolymer latex produced from vinyl pyridine-containing monomer, 1,3-diene hydrocarbon monomer and a vinyl-containing monomer,

B. non-self-crosslinkable elastomeric latex having a gel

content of less than 40% and an average particle size of less than around 2000 angstroms,

C. carboxylated butadiene polymer having an amount of bound styrene not exceeding 75 weight percent of the copolymer and having an amount of carboxylation in the range of about 1 to about 10 weight percent of the copolymer, where the amount of the copolymer present is in the range of about 3 to about 10 weight percent of the dry solids of the aqueous coating composition, and

(2) phenolic aldehyde condensate polymer,

(3) and water.

4,440,882

EMULSION BASED ON EPOXY RESIN AND POLYAMMONIUM SALTS AND ITS PREPARATION

Joern-Volker Weiss, Haltern, and Heinz Riemer, Bottrop, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 504,929

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222528

Int. Cl.³ C08L *63/00;* **C08K** *5/16;* **C08J** *3/06;* **C04B** *13/26*

U.S. Cl. 523—401 **15 Claims**

1. An epoxy resin-polyammonium salt emulsion comprising

(a) a liquid epoxy resin;

(b) water,

(c) an emulsifier comprising a primary aliphatic alcohol of 12–14 carbon atoms; an adduct thereof with up to 5 ethylene oxide groups; or a polyglycol ester of a C_{10-22}-aliphatic carboxylic acid; and

(d) a latent curing agent comprising the reaction product obtained by complete neutralization with oxalic acid of (i) a polyamine of the formula

$$H_2N—CH_2—CH_2—NH—_x\,H$$

wherein x=2, 3, or 4,

or of (ii) a reaction product, containing amino groups, of such a polyamine with a fatty acid.

4,440,883

ELECTRICALLY INSULATING ENCAPSULATION COMPOSITION FOR SEMICONDUCTOR ARRANGEMENTS

Erich Pammer, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,122

Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118130

Int. Cl.³ C08K *3/22*

U.S. Cl. 523—402 **14 Claims**

1. Method for the manufacture of an electrically insulating encapsulating composition for semiconductor arrangements free of contaminating traces of radioactivity which causes soft-error failure through alpha radiation which comprises forming the encapsulating material by admixing a resin and an inorganic filler in the form of a radiation-free compound selected from the group of silicon compounds consisting of a silicon oxide, a silicon oxide hydrate, a silicon nitride, and from the group of aluminum compounds consisting of an aluminum oxide and an aluminum hydroxide, said silicon oxide, silicon oxide hydrate and silicon nitride prepared from a radiation-free, highly volatile silicon halogenide compound and said aluminum oxide and aluminum hydroxide prepared from a radiation-free, highly volatile aluminum halogenide compound.

4,440,884

CAUSTIC SENSITIVE, WATER RESISTANT LABELING ADHESIVE

Leonard C. Jannusch, New Brighton, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Filed Oct. 20, 1982, Ser. No. 435,356

Int. Cl.³ C08L *3/00;* **C09J** *3/06, 3/24;* **B32B** *9/02*

U.S. Cl. 524—26 **37 Claims**

1. An aqueous adhesive, capable of forming substantial bonds resistant to humidity and water, and capable of rapidly debonding in the presence of strong base, which comprises an effective debonding amount of finely divided aluminum, an effective amount of a natural product bonding agent, and water.

4,440,885

PEROXIDE EMULSIONS AND SIZING COMPOSITION CONTAINING SAME

Albert E. Tamosauskas, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 136,644, Apr. 2, 1980, abandoned. This application Apr. 2, 1982, Ser. No. 364,713

Int. Cl.³ C08K *3/40, 5/54, 9/06;* **C03C** *17/30*

U.S. Cl. 524—57 **25 Claims**

1. Aqueous sizing composition for treating glass fibers, wherein the sizing composition has an aqueous emulsion of an organic peroxide that is a solid at about 20° C. and that has limited solubility or is insoluble in water, comprising:

(a) an amount of an aqueous emulsion of the solid organic peroxide to give an amount of active peroxide in the aqueous sizing composition in the range of about 0.1 to about 6 percent wherein:

(1) the solid organic peroxide with limited water solubility or that is insoluble in water selected from the group consisting of hydroperoxides, alpha-oxy, and alpha-peroxy hydroperoxides, dialkyl peroxides, aldehyde and ketone peroxides, diacyl peroxides, peroxy esters, peroxy acids, peroxy dicarbonates, monoperoxy carbonates and perketals is present in an amount of about 1 to about 70 percent by weight of the aqueous emulsion,

(2) about 1 to about 70 weight percent of a hydrocarbon solvent having a kauri-butanol number from about 10 to about 60 when the organic peroxide is substantially aliphatic, or having a kauri-butanol number of about 40 to about 100 when the organic peroxide has substantial aromaticity,

(3) about 1 to about 15 weight percent of a nonionic emulsifier blend having 3 emulsifiers, selected from the group consisting of polyalkylene glycol ethers, polyethoxy phenols, alkyl polyether alcohols, ethylene oxide alkylated phenol condensation products, alkyl aryl polyether alcohols, and polyoxypropylene-polyoxyethylene condensates, phenoxy polyethoxy ethanols, polyethylene derivatives of fatty acids, partial esters of sorbitol anhydrides; ethoxylated alcohols, ethoxylated alkyl phenols, ethoxylated fatty acids, ethoxylated fatty esters and oils; glycerol esters, glycol esters, monoglycerides and derivatives, sorbitan derivatives, sucrose esters and derivatives, and mixtures thereof each in proportions to give an overall hydrophilic-lipophilic balance (HLB) level for the emulsifier system in the range of about 9 to about 20, and

(4) at least about 27 weight percent of water;

(b) about 0.5 to about 10 weight percent of a coupling agent; and

(c) about 70 to about 99 weight percent water.

4,440,886

ASPHALT COMPOSITIONS

Gerard Kraus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1982, Ser. No. 445,309
Int. Cl.³ C08L 95/00
U.S. Cl. 524—68 11 Claims

1. An asphalt composition stabilized against viscosity increases at elevated temperatures comprising asphalt and a finite small effective viscosity stabilizing amount of at least one alkali metal nitrite.

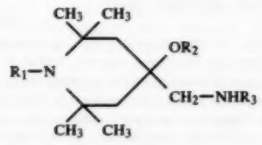
4,440,887

4-AMINOMETHYLPOLYALKYLPIPERIDINES USEFUL AS LIGHT STABILIZERS

Hans Hinsken, Kandern, Fed. Rep. of Germany; Wolfgang Mueller, Allschwil, Switzerland, and Hermann Schneider, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jan. 22, 1982, Ser. No. 341,614
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1981, 3102718
Int. Cl.³ C07D 211/48; C08K 5/34; C09D 3/81
U.S. Cl. 524—99 20 Claims

1. A compound of formula I

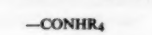


I

in which

R_1 is hydrogen or C_{1-8}alkyl;

R_2 is hydrogen, (C_{1-22}alkyl)carbonyl, phenyl (C_{1-4}alkyl)carbonyl, cyclohexylcarbonyl, phenylcarbonyl in which the phenyl ring is unsubstituted or substituted by 1 or 2 C_{1-12}alkyl groups having a total of not more than 18 carbon atoms, or a group of formula (a)

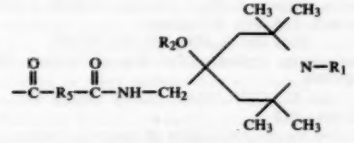


(a)

where

R_4 is C_{1-18}alkyl unsubstituted or substituted by a —N=C=O group, cyclohexyl, benzyl, phenyl, or (C_{1-12}alkyl)-phenyl; and

R_3 is (C_{1-22}alkyl) carbonyl, a group of formula (a) or is a group of formula (b)



(b)

where R_5 is C_{1-20}alkylene or phenylene.

6. A polymeric material stabilized against the effects of light, containing from 0.01 to 5% by weight of a compound of formula I, stated in claim 1.

4,440,888

FIRE RESISTANT HOT-MELT ADHESIVES CONTAINING MODIFIED POLYETHYLENE

Mary J. Cook, and Kenneth W. Hyche, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,485
Int. Cl.³ C08K 5/51
U.S. Cl. 524—139 9 Claims

1. An adhesive composition capable of being used as a hot-melt adhesive comprising a blend of

(a) about 20 to 60 percent by weight of at least one modified polyethylene having a saponification number of about 3 to 10 prepared by reacting polyethylene with a member selected from the group consisting of an unsaturated polycarboxylic acid, an unsaturated polycarboxylic anhydride, and an unsaturated polycarboxylic ester,

(b) about 30 to 70 percent by weight of at least one phosphate ester or halogenated organic flame retardant compound and at least one inorganic compound of antimony, boron or tin, said inorganic compound being present in an amount of 3 to 15 weight percent of the 30 to 70 percent by weight combination, and

(c) about 5 to 40 percent by weight of at least one tackifier resin selected from the group consisting of hydrocarbon resin, polyterpene resin and rosin ester resin.

4,440,889

POLYETHYLENE TEREPHTHALATE MOLDING COMPOSITIONS

William L. Hergenrother, and John M. Doshak, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 23, 1982, Ser. No. 391,200
Int. Cl.³ C08K 5/52
U.S. Cl. 524—143 8 Claims

1. Polyethylene terephthalate molding compositions which can be molded at temperatures of 100° C. or less comprising:

(a) from about 40 to about 70 parts by weight per 100 parts of total composition of a polyethylene terephthalate having an intrinsic viscosity of 0.4 to 1.0 dl/g as measured at 25° C. in a 1:1: mixture of phenol and tetrachloroethane;

(b) from about 0.5 to about 5.0 parts by weight per 100 parts by weight of total composition of a plasticizer selected from the group consisting of benzoate esters of polyols, phthalate esters and phosphate esters;

(c) from about 0.5 to about 10.0 parts by weight per 100 parts by weight of total composition of a lubricating polymer;

(d) from about 0.1 to about 5.0 parts by weight per 100 parts by weight of total composition of a nucleating agent;

(e) from about 20 to about 60 parts by weight per 100 parts by weight of total composition of a reinforcing material or mixture of reinforcing material and filler;

(f) from about 0.01 to about 1.0 parts by weight per 100 parts by weight of total composition of a molecular weight reducing agent for said polyethylene terephthalate, wherein said molecular weight reducing agent is selected from the group consisting of benzoic acid, neopentyl glycol and water.

4,440,890

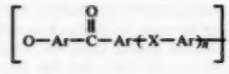
FLAME RETARDANT POLY(ARYL KETONE)

Lloyd M. Robeson, Whitehouse Station, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 21, 1983, Ser. No. 506,392
Int. Cl.³ C08K 5/42
U.S. Cl. 524—159 21 Claims

1. A flame retardant molding composition comprising:

(a) a poly(aryl ketone) of the following formula:



wherein Ar is independently a divalent aromatic radical selected from phenylene, biphenylene or naphthylene, X is independently O,

or a direct bond, and n is an integer of from 0 to 3, and

(b) a flame retarding amount of an alkali or alkaline earth metal salt of an aromatic sulfonic acid.

4,440,891

HALOGEN-CONTAINING POLYMERS STABILIZED WITH ORGANIC ANTIMONY COMPOUND AND AN ORTHO MERCAPTO PHENOL COMPOUND

Jack D. Taylor, Katy, Tex., and Kenneth V. Smith, Cincinnati, Ohio, assignors to Carstab Corporation, Chicago, Ill.

Filed Aug. 9, 1982, Ser. No. 406,584

Int. Cl.³ C08K *5/37*

U.S. Cl. 524—177 **6 Claims**

1. A stabilizer composition for halogen containing organic polymer comprising:

A. an organic antimony compound or mixture of organic antimony compounds having at least one antimony atom and at least one antimony to sulfur to carbon linkage wherein the sulfur to carbon part of each antimony to sulfur to carbon linkage is derived from the group consisting of mercaptides, mercapto acids, mercapto esters, mercapto alkyl esters of carboxylic acids, and mixtures thereof; and

B. an organic compound or mixture of organic compounds having at least one carbocyclic aromatic ring which has bonded directly thereto a total of from two to six hydroxyl and mercapto groups, with the proviso that at least one hydroxyl group and at least one mercapto group are bonded directly to adjacent ring carbon atoms.

5. A polymer composition comprising a halogen-containing organic polymer normally susceptible to heat induced deterioration and an effective amount of a stabilizer composition according to claim 1.

4,440,892

AGENTS HAVING A TUMOR-INHIBITING ACTION AND THEIR USE

Gerhard D. Wolf, Dormagen; Bruno Bömer, Leverkusen, and Robert Bierling, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

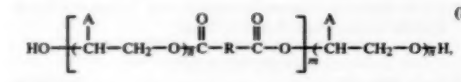
Filed Jun. 25, 1981, Ser. No. 277,473

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026447

Int. Cl.³ C08K *5/06;* **C08F** *20/42*

U.S. Cl. 524—283 **2 Claims**

1. A pharmaceutical composition containing as an active ingredient is a water-soluble polyester based on one or more polyether-glycols, corresponding to the formula



(II)

in which

A denotes statistically distributed hydrogen or methyl, 67 to 100 mol % being hydrogen atoms and 0–33 mol % being methyl groups,

R denotes an alkylene or arylene radical having up to 6 carbon atoms,

n denotes a number from 9 to 300 and

m denotes a number from 1 to 15.

4,440,893

MOLDING OF POLYMERS

Lyle R. Kallenback, and Faber B. Jones, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 16, 1983, Ser. No. 467,110

Int. Cl.³ C08K *3/22*

U.S. Cl. 524—305 **22 Claims**

1. A composition of matter having substantially no bubble formation when molded, said composition comprising:

(a) a polymer selected from the group consisting of homopolymers and copolymers of ethylene, said polymer being one that has been produced by a solution polymerization process using a chromium containing polymerization catalyst,

(b) an acetylene peroxy compound, and

(c) a metal oxide selected from the group of oxides of metals of Group IIA and IIB of the Periodic Table.

4,440,894

THERMOSETTING VINYL ACETATE TETRAPOLYMER COATINGS

Zychowski, Edwin A., Des Plaines; Kenneth E. Jasenof, Skokie, and Artemio L. Jimenez, Hanover Park, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 8, 1982, Ser. No. 433,389

Int. Cl.³ C08F *00/000*

U.S. Cl. 524—390 **9 Claims**

1. A thermosetting solvent solution coating composition characterized by forming hard and impact resistant baked coatings of good gloss retention on exterior exposure comprising, an organic solvent medium comprising a butanol having dissolved therein a solution copolymer obtained by copolymerizing from 55% to 75% of vinyl acetate with from 15% to 40% of C_2–C_8 alkyl acrylate or methacrylate, from 3% to 10% of C_2–C_4 hydroxyalkyl acrylate or methacrylate, and from about 0.5% to about 5% of copolymerizable monoethylenically unsaturated carboxylic acid in organic solvent solution medium consisting essentially of a butanol at a solids content of at least 65%, said copolymer being in admixture with from 8% to 20%, based on the mixture, of a polyalkoxymethyl melamine with a volatile alcohol.

7. A coating composition as recited in claim 1 in which said composition is reduced to coating viscosity with aromatic hydrocarbons.

4,440,895

SYNTHETIC RUBBER DISPERSIONS CONTAINING CARBOXYL GROUPS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Ferdinand Heins, Monheim-Baumberg; Martin Matner, Odenthal, and Hellmut Striegler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,601

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047084

Int. Cl.³ C08F *212/10, 212/34;* **C08L** *0/00*

U.S. Cl. 524—822 **1 Claim**

1. Process for the preparation of aqueous synthetic rubber dispersions by emulsion polymerization of from 0.3 to 1.0% by weight of itaconic acid and 99.0 to 99.7% by weight of a mixture of from 10 to 90% by weight of butadiene, 10 to 90% by weight of styrene, 0 to 50% by weight of (meth)acrylonitrile and 0 to 25% by weight of N-methylol-(meth)-acrylamide

and N-methoxymethyl-(meth)acrylamide in the presence of from 0.05 to 0.5% by weight, based on the copolymer, of an emulsifier consisting of the sulphate or sulphonate type comprising introducing part of the water, part or all of the itaconic acid, all or part of the emulsifier and part of the other monomers into a reactor equipped with a stirrer, adjusting the pH to 3.5 to 6 by addition of a base, initiating the polymerization at a temperature of at least 70° C. by addition of part of 0.5 to 1.5% by weight, based on the total quantity of monomers, of an ammonium peroxodisulphate and/or an alkali metal peroxodisulphate and adding at least one non-aqueous stream of the remaining monomers, and at least one aqueous stream containing the remainder of the peroxodisulphate while maintaining a temperature of the reactor of 75° to 150° C. until the monomers have undergone almost complete conversion.

4,440,896

PROCESS FOR THE PREPARATION OF LATTICES OF VINYL ACETATE POLYMERS

Jean-Luc Schuppiser, Claye Souilly, and Jean-Claude Daniel, Fontenay-Sous-Bois, both of France, assignors to Rhone-Poulenc Specialties Chimiques, France

Filed Aug. 5, 1982, Ser. No. 405,412
Claims priority, application France, Aug. 10, 1981, 81 15436
Int. Cl.³ C08F 2/16
U.S. Cl. 524—458 11 Claims

1. A process for the preparation of a latex of a vinyl acetate polymer, comprising the step of polymerizing vinyl acetate or vinyl acetate and a monomer copolymerizable with vinyl acetate, in aqueous emulsion, in the presence of an initiator, an emulsifier and a protective colloid, said protective colloid comprising a water-soluble polymer (a) containing at least one monomer selected from the group consisting of acrylamide, methacrylamide, substituted or unsubstituted N-alkyl derivatives of acrylamide and substituted or unsubstituted N-alkyl derivatives of methacrylamide, and a water-soluble polymer (b) of ethylene glycol, said polymer (b) having molecular weight between 1,000 and 50,000.

11. A latex of a vinyl acetate polymer, obtained in accordance with the process of claim 1, said latex containing particles of said polymer in a concentration of 10 to 70% by weight, said polymer having a glass transition temperature between −20° and 50° C., said particles having a size distribution between 0.05 and 1 μm, and said latex having a viscosity between about 50 mPa.s and 80,000 mPa.s.

4,440,897

PROCESS OF MAKING SUBSTANTIALLY EXTERNAL SURFACTANT-FREE VINYL POLYMER EMULSION PRODUCTS

Rudolf Maska, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 1, 1982, Ser. No. 383,415
Int. Cl.³ C08L 33/08, 35/02
U.S. Cl. 524—460 10 Claims

1. A process of preparing a substantially external surfactant—free polymer emulsion product which comprises the steps of:

(a) dispersing in water an amine or inorganic base neutralized saturated polymer, said polymer being derived from a first monomer mixture consisting essentially of from about 2 to about 100 percent by weight of a carboxylic acid or anhydride having ethylenic unsaturation and the balance, if any, of at least one other copolymerizable ethylenically unsaturated monomer wherein said monomer is alkyl acrylate or alkyl methacrylate containing from 1 to 8 carbon atoms, hydroxyalkyl acrylate or methacrylate containing from 2 to 4 carbon atoms in the alkyl moiety, styrenes, acrylamides, methacrylamides or a mixture thereof;

(b) adding a second monomer mixture of vinyl monomer and a polymerization catalyst to the dispersion of step (a), said vinyl monomer being vinyl chloride, vinylidene chloride, or a mixture thereof, and a proportion of the second monomer mixture added being such as to consist essentially of from about 25 percent to about 75 percent by weight of the total weight of the monomers used in forming the polymer emulsion product; and

(c) polymerizing the mixture of step (b) to form the polymer emulsion product.

4,440,898

CREPING ADHESIVES CONTAINING ETHYLENE OXIDE/PROPYLENE OXIDE COPOLYMERS

William S. Pomplun, Winnebago County, and Herbert E. Grube, Outagamie County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 17, 1982, Ser. No. 389,192
Int. Cl.³ C08L 29/04, 39/06, 71/02
U.S. Cl. 524—503 4 Claims

1. A creping adhesive for use in a throughdrying process for the manufacture of creped wadding, said creping adhesive consisting essentially of an aqueous admixture of ethylene oxide/propylene oxide copolymer and a water soluble or water dispersible high molecular weight thermoplastic polymer selected from the group consisting of polyvinyl alcohol and polyvinyl pyrrolidone and having sufficient strength to form an adhesive film, wherein the relative amount of ethylene oxide moieties in the ethylene oxide/propylene oxide copolymer is from about 10 to 80 weight percent based on the combined dry weights of the ethylene oxide/propylene oxide copolymer and the thermoplastic polymer and wherein the amount of the ethylene oxide/propylene oxide copolymer is from about 40 to about 60 dry weight percent of the adhesive composition.

4,440,899

POLYOLEFIN POWDER COMPOSITIONS, IN PARTICULAR POLYETHYLENE POWDER COMPOSITIONS, WITH IMPROVED ADHESION, AND OBJECTS MADE OR TO BE MADE OF SUCH COMPOSITIONS

Erik R. Peerlkamp, Born, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Aug. 31, 1981, Ser. No. 298,253
Claims priority, application Netherlands, Aug. 30, 1980, 8004958
Int. Cl.³ C08K 5/00; C08J 3/20; C08L 23/04, 23/10
U.S. Cl. 524—528 8 Claims

1. A polyolefin composition for rotational molding having improved adhesion to a substrate and easily releasable from mold walls, comprising an intimate mixture of about 20 percent to about 99.5 percent by weight of a first stabilized polyolefin powder, said first polyolefin powder containing at least about 0.025 percent by weight of a stabilizer, with about 0.5 percent to about 80 percent by weight of a second at most slightly stabilized polyolefin powder, said second powder having a crystalline melting point which is at least 1° C. higher than said first powder such that during rotational molding said composition forms a stabilized outer layer and a non-stabilized inner layer.

4,440,900

METHOD FOR MAKING COATINGS AND ADHESIVE BONDS WITH POLYVINYL CHLORIDE PLASTISOLS HAVING IMPROVED ADHESION, AND PLASTISOLS FOR SAID PROCESS

Christian Burba, Ascheberg-Herbern; Ulrich Goeke, Luenen, and Norbert Esper, Bergkamen, all of Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 497,163

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221354

Int. Cl.³ B05D *7/24, 5/10;* C09D *3/74;* C09J *3/14*

U.S. Cl. 524—569 10 Claims

1. A plastisol composition for the production of coatings or adhesive bonds comprising a finely divided vinyl chloride polymer, a plasticizer, and from 0.5 to 5 percent by weight of the entire plastisol, of an adhesion promoter which is a condensation product of

(A) a polymerized fatty acid,

(B) a polycarboxylic acid having three or more carboxyl groups, or an anhydride or ester thereof, in an amount from 3 to 20 percent by weight of said polymerized fatty acid, and

(D) an excess, based on the number of carboxyl groups of components (A) and (B), of a polyalkylene polyamine.

4,440,901

PROCESS FOR THE PRODUCTION OF PLASTIC BASED ON POLYISOCYANATES

Helmut Reiff, and Dieter Dieterich, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 509,910

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1982, 3227017

Int. Cl.³ C08G *18/10*

U.S. Cl. 524—591 13 Claims

1. A process for the production of plastics based on an isocyanate-polyaddition product which may optionally contain ionic groups with the provision that the ionic groups, if present, are exclusively sulfonate groups which comprises

(1) forming an isocyanate group-containing prepolymer from

(a) a compound which has a molecular weight of from 146 to about 10,000, is substantially free from hydroxyl groups, contains at least two terminal carboxyl groups and optionally contains ether and/or ester groups,

(b) excess quantities of an organic nonaromatic polyisocyanate which has at least one cyclohexane ring and exclusively contains aliphatically- and/or cycloaliphatically-bound isocyanate groups and

(c) up to 10 equivalent percent, based on the isocyanate-reactive groups in component (a), of a compound which is monofunctional for the purpose of the isocyanate-addition reaction and

(2) reacting the product of step (1) with

(d) a chain-lengthening agent comprising water, a polyamine containing at least two primary and/or secondary amino groups or hydrazine or a derivative thereof containing at least two primary and/or secondary amino groups.

4,440,902

BISESTERS OF ALKENYLSUCCINIC ACIDS AND ETHYLENE OXIDE/PROPYLENE OXIDE BLOCK POLYMERS AND THEIR USE

Helmut Diery, Kelkheim, Fed. Rep. of Germany, and Bernhard Mees, Charlotte, N.C., assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

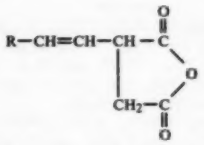
Filed Sep. 9, 1982, Ser. No. 416,100

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136213

Int. Cl.³ C08F *283/06;* C08L *71/02*

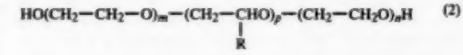
U.S. Cl. 525—404 2 Claims

1. A bisester of alkenylsuccinic acid and an ethylene oxide/propylene oxide block polymer, obtained by reaction of alkenylsuccinic anhydride of the Formula 1



(1)

wherein R denotes branched or unbranched C_2–C_{20} alkyl, with an ethylene oxide/propylene oxide block polymer of the Formula 2



(2)

wherein R denotes methyl or ethyl, n and m are numbers selected such that the polyethylene oxide contribution to the total molecule of the block polymer is 5 to 80% of the molecular weight and p is a number from 10 to 70.

4,440,903

DIHALOISOCYANIDE DERIVATIVES OF POLYMERS FOR COUPLING NUCLEOPHILES

Leon Golstein, Rehovot; Mordechai Sokolovsky, Tel-Aviv, and Amihay Freeman, Rishon Lezion, all of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel-Aviv, Israel

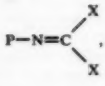
Filed Jun. 30, 1978, Ser. No. 921,055

Int. Cl.³ C12N *11/08, 11/06;* C07G *7/00;* C07C *143/00*

U.S. Cl. 525—54.1 4 Claims

2. A process for coupling at least one nucleophilic group to a polymeric backbone, comprising:

converting an isocyanide-substituted polymer, the backbone of which is selected from the group consisting of polyamides, polyesters and urea-formaldehyde polymers, to a dihaloisocyanido polymer of the general formula



wherein P is the polymeric backbone and X is chlorine or bromine, by reacting the isocyanide-polymer with a solution of the halogen in an inert non-aqueous solvent; and

reacting said dihaloisocyanido polymer with a bifunctional or multifunctional nucleophile, wherein said nucleophile is a polymer containing nucleophilic groups capable of reacting with the $—NCX_2$ groups of the dihaloisocyanido polymer.

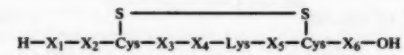
4,440,904

NONAPEPTIDE ANTI-SECRETORY AGENTS

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,168
Int. Cl.³ C08L 89/00; C07C 103/52; A61K 37/00
U.S. Cl. 525—54.11 4 Claims

1. A compound of the formula:



in which

X_1 is either L- or D-His, Lys or Arg;

X_2 is either L- or D-Phe, Tyr, Trp, Leu, Met, His, Glu or Asp;

X_3 is Phe, Tyr, Trp, Leu or Met;

X_4 is L- or D-Trp;

X_5 is Thr, Val or Abu; and,

X_6 is either L- or D-Phe, Tyr, Trp, Leu, Met, Ser or Thr;

the linear precursor intermediates thereof, pharmaceutically acceptable salts and amides thereof.

4,440,905

DUNKELSPERSERS

David L. Dunkelberger, Newtown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 135,945, Mar. 31, 1980, abandoned. This application Aug. 13, 1981, Ser. No. 256,202
Int. Cl.³ C08L 51/04
U.S. Cl. 525—66 17 Claims

1. An improved impact modifier composition comprising a blend of an elastomeric impact modifier and a dunkelsperser, the weight ratio of said elastomeric impact modifier to said dunkelsperser being from about 99.5 to 0.5 to about 96 to 4, said dunkelsperser being a polymer or a copolymer, said dunkelsperser polymer or copolymer being formed from at least 50 weight percent of at least one of the monomers selected from the group consisting of styrene, substituted styrene, an olefin, and an unsaturated ester of an organic acid different from the methyl ester of methacrylic acid, and where said dunkelsperser substantially reduces gel colonies in a rigid thermoplastic matrix polymer containing said improved modifier composition.

4,440,906

THERMOPLASTIC MOLDING MATERIAL

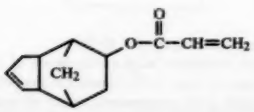
Franz Brandstetter, Neustadt; Juergen Hambrecht, Neckargemuend, and Adolf Echte, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 6, 1982, Ser. No. 337,404
Int. Cl.³ C08L 61/04
U.S. Cl. 525—68 2 Claims

1. A thermoplastic molding material comprising a mixture of

(a) a polymer of a monomer selected from the group consisting of styrene, nuclear-alkylated styrene, sidechain-alkylated styrene and mixtures thereof, having an intrinsic viscosity of from about 40 to 140 ml/g, as the hard component,

(b) a poly(alkyl acrylate), alkyl being of about 2 to 8 carbon atoms, which is prepared by crosslinking an acrylic ester with about 0.5 to 20% by weight of tricyclodecenyl acrylate having the formula (I)



(I)

based on the comonomers employed, thereby preparing a grafting base, and grafting the crosslinked acrylic ester, to the extent of 10 to 60% by weight, solely with stryene, wherein said poly(alkyl acrylate) has a glass transition temperature of below 0° C., as the soft component and

(c) a polyphenylene ether with an average chain length corresponding to not less than 50 benzene nuclei, the weight ratio a:b being (95–40):(5–60) and the weight ratio (a+b):c being (5–90):(95–10).

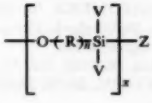
4,440,907

PROCESS OF PRODUCING A WATER-CURABLE, SILANE MODIFIED ALKYLENE-ALKYL ACRYLATE COPOLYMER BY REACTING AN ALKYLENE-ALKYL ACRYLATE COPOLYMER WITH A POLYSILOXANE PREDISPERSED IN A THERMOPLASTIC RESIN MATRIX

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 294,784, Aug. 20, 1981, Pat. No. 4,369,289, which is a continuation-in-part of Ser. No. 192,319, Sep. 30, 1980, Pat. No. 4,328,323, which is a continuation-in-part of Ser. No. 70,785, Aug. 19, 1978, Pat. No. 4,291,136, which is a continuation-in-part of Ser. No. 892,153, Mar. 31, 1978, abandoned. This application Sep. 17, 1982, Ser. No. 419,142
Int. Cl.³ C08L 23/26, 83/10
U.S. Cl. 525—106 19 Claims

1. A process of producing a water-curable, silane modified alkylene-alkyl acrylate copolymer which comprises admixing an alkylene-alkyl acrylate copolymer, an organo titanate and polysiloxane having the formula:



wherein R is a hydrocarbon radical, each V is hydrogen, a hydrocarbon radical or a hydrolyzable group and Z is a hydrolyzable group, n is an integer having a value of 1 to 18 inclusive and x is an integer having a value of at least 2, said polysiloxane predispersed in a thermoplastic resin matrix which is compatible with the said polysiloxane and said alkylene-alkyl acrylate copolymer and does not adversely interfere with the reaction between said polysiloxane and said alkylene-alkyl acrylate copolymer, with the result that said polysiloxane reacts with said alkylene-alkyl acrylate copolymer to produce a water-curable, silane modified copolymer.

4,440,908

FINELY DIVIDED IONOMER COATED THERMOPLASTIC RESIN

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 205,838, Nov. 10, 1980, Pat. No. 4,336,210. This application Sep. 8, 1981, Ser. No. 299,912
Int. Cl.³ C08L 33/02, 23/04, 23/26; C08J 3/12
U.S. Cl. 525—196 16 Claims

1. A dry powder of finely dispersed thermoplastic resin comprising resins selected from homopolymers and copolymers of olefins wherein the individual resin particles are substantially coated uniformly with a substantially water-insoluble ionomer, the ionomer including at least about 50 mol percent of an ethylenically unsaturated alpha-olefin of about 2 to about 10 carbon atoms, from about 0.2 to about 50 mol percent of an alpha, beta ethylenically unsaturated carboxylic acid having from about 3 to about 8 carbon atoms, with at least 10% of the acid groups being neutralized, said individual resin particles having diameters greater than about 10 microns and being present in the form of a finely divided dry powder.

4,440,909

BLENDS OF BIS(ALLYL CARBONATE) MONOMERS WITH POLYMERS AND POLYMER BLENDS PRODUCED THEREFROM

John C. Crano, and Ronald L. Haynes, both of Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 219,063, Dec. 22, 1980, Pat. No. 4,346,197. This application Jan. 27, 1982, Ser. No. 343,122
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ C08L 47/00
U.S. Cl. 525—277 7 Claims

1. A resin comprising a bis(allyl carbonate) monomer chosen from the group consisting of alkylene bis(allyl carbonate) monomers, alkylene ether bis(allyl carbonate) monomers, alkylene polyether bis(allyl carbonate) monomers, alkylene carbonate bis(allyl carbonate) monomers, and mixtures thereof; and a dispersed copolymer of (a) a monofunctional vinyl monomer, and (b) a difunctional monomer having vinyl and allyl functionality, said dispersed copolymer being swellable by or soluble in the monomer of the bis(allyl carbonate) and having a viscosity average molecular weight above 100,000, said resin being pseudoplastic, fusible, capable of being cured to a hard resin, and having a shear stress of 10^4 to 10^7 dynes per square centimeter at a shear rate of 10^1 to 10^4 per second.

4,440,910

TOUGHENED CYANOACRYLATES CONTAINING ELASTOMERIC RUBBERS

John T. O'Connor, Wallingford, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Jan. 18, 1982, Ser. No. 339,952
Int. Cl.³ C08L 23/08, 51/06, 35/04
U.S. Cl. 525—295 8 Claims

1. A curable adhesive comprising a substantially solvent-free mixture of:

(a) a monomeric ester of 2-cyanoacrylic acid, and

(b) about 0.5% to about 20% by weight of an elastomeric polymer selected from the group consisting of elastomeric copolymers of a lower alkene monomer and (i) acrylic acid esters (ii) methacrylic acid esters or (iii) vinyl acetate.

4,440,911

MODIFIED POLYETHYLENE AND LAMINATE THEREOF

Hiroshi Inoue; Masaaki Isoi, both of Saitama, and Kazuo Sei, Kanagawa, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,401
Claims priority, application Japan, Apr. 7, 1981, 56-51098
Int. Cl.³ C08F 255/02
U.S. Cl. 525—301 11 Claims

1. A fabricable thermoplastic composition which comprises linear low density copolymer of ethylene and an alpha-olefin wherein said alpha-olefin is selected from the group consisting of butene-1, hexene-1, methyl pentene-1, and octene-1 and comprises between 3 and 14 weight percent of the copolymer, said copolymer being reacted with from 0.01 to 3 wt. % of an unsaturated carboxylic acid or a derivative thereof, based on the weight of the copolymer, said linear low density copolymer being substantially free of long chain branching and having a density of 0.915 to 0.935 and the weight-average molecular weight/number-average molecular weight ratio from 3 to 12.

4,440,912

COPOLYMERS OF POLYARYLATES WITH POLYETHYLENE ARYLATES AND PROCESS FOR THEIR PREPARATION

Daniel W. Fox; Bruce A. Kaduk, and John B. Starr, Jr., all of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 187,768, Sep. 16, 1980, Pat. No. 4,358,568. This application Apr. 23, 1982, Ser. No. 371,263
Int. Cl.³ C08L 67/00, 69/00
U.S. Cl. 525—439 3 Claims

1. A copolymer prepared by blending of (1) a high molecular weight polyethylene arylate having an intrinsic viscosity of at least about 0.5 dl./g., as measured in a 60:40 mixture of phenol and tetrachloroethane at 25° C. and (2) a low or high molecular weight bisphenol-A-isophthalate-terephthalate carbonate polyarylate or bisphenol-A-isophthalate-terephthalate-polyarylate, said low molecular weight polyarylate having an intrinsic viscosity of about 0.1–3.0 dl./g., as measured in a 60:40 mixture of phenol and tetrachloroethane at 25° C. and said high molecular polyarylate having an intrinsic viscosity of at least about 0.5–0.6 dl./g. as measured in a 60:40 mixture of phenol and tetrachloroethane, and heating to 265°–270° C., said copolymer being transparent, tough, completely soluble in chlorinated solvent, maintaining its dimensional stability over a wide range of temperatures, and possessing a single glass transition temperature.

4,440,913

COATING COMPOSITION FOR PLIABLE SUBSTRATES

Shinji Sugiura; Yasuhiro Fujii; Katsunori Sato; Tuguo Nezu, and Yasumasa Okumura, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Dec. 22, 1982, Ser. No. 452,047
Claims priority, application Japan, Dec. 25, 1981, 56-209315; Dec. 25, 1981, 56-209316
Int. Cl.³ C08L 67/04
U.S. Cl. 525—443 3 Claims

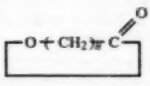
1. In a heat-curable coating composition containing an oil-free polyester resin composed substantially of a condensation product of an aliphatic polybasic acid, an aromatic polybasic acid, or the anhydrides thereof and a polyhydric alcohol and an aminoaldehyde resin as binder components, the improvement wherein

(A) the materials for said oil-free polyester resin contain 40 to 75% by weight, based on the total weight of said materials, of at least one polyester-forming compound selected from the group consisting of

(a) an aliphatic dibasic acid represented by the formula $HOOC—CH_2—_nCOOH$ wherein n is an integer of 4 to 10 as a polybasic acid,

(b) an aliphatic glycol represented by the formula $HO—CH_2—_nOH$ wherein n is an integer of 4 to 10 as a polyhydric alcohol, and

(c) a lactone represented by the formula



wherein n is an integer of 4 to 10,

(B) the entire polybasic acid components of the polyester resin contain at least 10%, based on the total weight of said polybasic acid components, of an alicyclic polybasic acid or its anhydride, and

(C) the polyester resin has a hydroxyl value of 20 to 95.

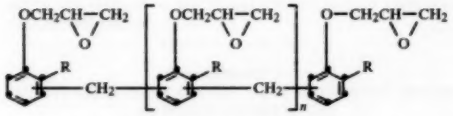
4,440,914
SOLID EPOXY RESIN SYSTEMS

David Helfand, Yorktown Heights, N.Y., and Ralph F. Sellers, Somerset, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 312,600, Oct. 19, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 419,663
Int. Cl.³ C08G 59/38
U.S. Cl. 525—482 17 Claims

1. A solid advanced epoxy resin comprising the reaction product resulting from a catalyzed advancement reaction of

(a) a polyepoxide resin having a functionality greater than two, said resin (1) corresponding to the formula



wherein R is H or CH_3 and n is about 0.2–6.0, or (2) being the tetraglycidyl ether of tetra[hydroxyphenyl)ethane;

(b) a diglycidyl ether of a polyhydric phenol or the alkyl or halogen derivatives thereof; and

(c) a polyhydric phenol or the alkyl or halogen derivatives thereof;

components (a) and (b) being present in concentration ranges of from 60–90%, by weight, and 10–40%, by weight, respectively, and component (c) being present in a concentration range of 2 to 23%, based on the total weight of components (a) and (b).

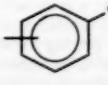
4,440,915
STABILIZED POLYPHENYLENE SULFIDE AND METHOD FOR PRODUCING SAME

Toshiyuki Asakura; Hiroaki Kobayashi, both of Ohtsu, and Yukio Noguchi, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 321,695, Nov. 16, 1981, abandoned. This application Nov. 22, 1982, Ser. No. 443,861
Claims priority, application Japan, Nov. 27, 1980, 55-165896
Int. Cl.³ C08F 283/00
U.S. Cl. 525—537 8 Claims

1. An essentially linear stabilized polyphenylene sulfide having a reduced degree of oxidizing crosslinking characteristics which comprises a recurring unit,

wherein n is greater than 20, and about 0.05 to about 10 mole % per phenylene sulfide unit of an aromatic constituent chemically bonded with said polyphenylene sulfide chain, said aromatic constituent containing an electron attractive group consisting of



and said stabilized polyphenylene sulfide has a melting point in the range of about 250° C. to about 350° C.

4,440,916
PROCESS FOR SOLID STATE FREE RADICAL REACTIONS

Paul F. Waters, and Thomas T. Scambos, both of Washington, D.C., assignors to General Technology Applications, Inc., Reston, Va.

Continuation of Ser. No. 198,385, Oct. 20, 1980, abandoned. This application May 6, 1982, Ser. No. 375,653
Int. Cl.³ C08G 81/00, 83/00; C08J 3/20
U.S. Cl. 525—54.2 9 Claims

1. A process for the solid state reaction of a first normally solid polymer with at least one other normally solid polymer which comprises:

generating free radicals on at least the surface of said first polymer by the mechanical working of said polymer at cryogenic temperature in an atmosphere non-reactive toward said free radicals;

maintaining at least said first polymer at cryogenic temperatures, and

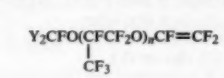
while at cryogenic temperatures, contacting said first polymer with said other polymer and subsequently heating at a rate and for a time sufficient to cause reaction between said first and second polymers.

4,440,917
VINYL ETHERS MONOMERS AND POLYMERS THEREFROM

Paul R. Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 330,332, Dec. 14, 1981, Pat. No. 4,414,159, which is a division of Ser. No. 191,301, Sep. 26, 1980, Pat. No. 4,334,082. This application Sep. 1, 1982, Ser. No. 413,787
Int. Cl.³ C08F 214/18
U.S. Cl. 526—243 7 Claims

1. A copolymer of a vinyl ether monomer of the formula:



wherein Y is selected from the group consisting of CF_2CN, CF_2CO_2R, CF_2CO_2H, CF_2CO_2M, CF_2CONH_2 and CF_2CONR_2; R is CH_3 or C_2H_5; n is an integer from 0 to 10; M is an alkali metal, ammonium or quaternary ammonium group; and at least one perfluorinated comonomer selected from the group consisting of tetrafluoroethylene, hexafluoropropylene, chlorotrifluoroethylene, perfluoroalkylvinyl ether wherein the alkyl group contains 1 to 4 carbon atoms, and the vinyl ether, $CF_2{=}CF[OCF_2CF(CF_3)]_mOCF_2CF_2SO_2F$, where m is 1 or 2.

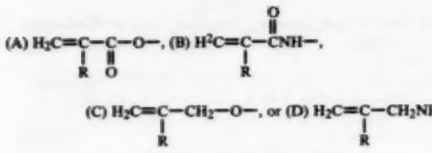
4,440,918
CONTACT LENS CONTAINING A FLUORINATED TELECHELIC POLYETHER

David E. Rice, Oakdale, and Jay V. Ihlenfeld, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

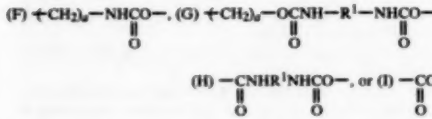
Filed Jan. 18, 1982, Ser. No. 340,473
Int. Cl.³ C08F 4/18; G02C 7/04
U.S. Cl. 526—246 14 Claims

1. An ophthalmic device selected from the group consisting of a contact lens and a corneal implant and comprising a polymer of a telechelic perfluoropolyether having a backbone of perfluorooxyalkylene units, a number average molecular weight between about 500 and 15,000, and at least one polymerizable ethylenically unsaturated group wherein said telechelic perfluoropolyether has the formula $Q{-}X{-}Y{-}(C_kF_{2k}O)_p(C_qF_{2q})_r{-}Z$ wherein p represents the number of $-C_kF_{2k}O-$ subunits in said backbone and is an integer of from 3 to 200, q is an integer of from 1 to 4, and k may be the same of different within each of said $-C_kF_{2k}O-$ subunits and is an integer of from 1 to 4

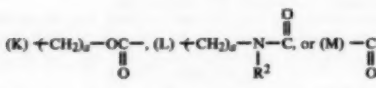
wherein Q is selected from



wherein R is selected from hydrogen or methyl;
wherein X is selected from (E) a covalent bond,



wherein R^1 is selected from a divalent aliphatic group having from 2 to 14 carbon atoms, a divalent 5- or 6-membered cyclic group having from 5 to 14 carbon atoms, or an arylene group having from 6 to 14 carbon atoms, and a in an integer of from 2 to 12;
wherein Y is selected from (J) $-CH_2)_b$,



wherein R^2 is a lower alkyl group having 1 to 4 carbon atoms, a is an integer of from 2 to 12, and b is an integer of from 1 to 12; provided that when
(1) Q is (A), then X is selected from (E), (F), or (G) and Y is selected from (J), (K), or (L);
(2) Q is (B), then X is selected from (E), (F), or (G) and Y is selected from (J), (K), or (L);
(3) Q is (C) then either
(i) X is (E) and Y is (M), or
(ii) X is selected from (E), (F), (G), (H), or (I) and Y is selected from (J), (K), or (L); and
(4) Q is (D) then either
(i) X is (E) and Y is (M), or
(ii) X is selected from (H) or (I) and Y is selected from (J), (K), or (L); and
wherein Z is selected from $-OC_kF_{2k+1}$, or Q—X—Y— wherein Q, X, Y and k are as defined above.

4,440,919

LOW N-VINYL LACTAM CONTENT BASED BIOMEDICAL DEVICES

Richard C. Chromecek, Macedon; Gary D. Friends, Ontario; Lawrence Y. Wissman, and Raymond A. Yourd, III, both of Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,353
Int. Cl.³ C08F *226/06, 226/08*; G03B *21/46*
U.S. Cl. 526—263 **21 Claims**

1. As a new article of manufacture a contact lens formed from a hydrophilic polymer formed by polymerizing (a) one or more N-vinyl lactams and/or heterocyclic N-vinyl monomers, said N-vinyl lactams being selected from the group consisting of N-vinyl-2-pyrrolidinone, N-(1-methyl) vinyl pyrrolidinone, N-vinyl-2-piperidone and N-vinyl-2-caprolactam which may be substituted in the lactam ring by one or more lower alkyl groups, said heterocyclic N-vinyl monomers being selected from the group consisting of N-vinyl imidazole, N-vinyl succinimide, N-vinyl diglycolylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone and N-vinyl-5-methyl-3-morpholinone, (b) one or more hydrophilic comonomers selected from the group consisting of hydroxyesters, free acids, amides and amines of acrylates, methacrylates, or itaconates, said hydrophilic monomer(s) being at least 50% of the total monomer of (a) and (b) present and (c) a resonance free di(alkene tertiary amine) cyclic crosslinking agent, said cyclic compound having the formula $CH_2{:}CG(CH_2)_xN{\sim}J{\sim}N(CH_2)_xCG{:}CH_2$ wherein x is 0 or 1, G is hydrogen or methyl and J is the balance of a structure forming cyclic dialkene urea, said agent being present in an amount from 0.01 to 10 weight percent of the total monomers of (a) and (b) present to form a crosslinked 3-dimensional polymeric network, said polymer having an oxygen permeability of at least 8×10^{-11} cm^2 cm/sec.cm^2 mmHg) and a tear initiation strength of at least 2 g/mm of thickness.

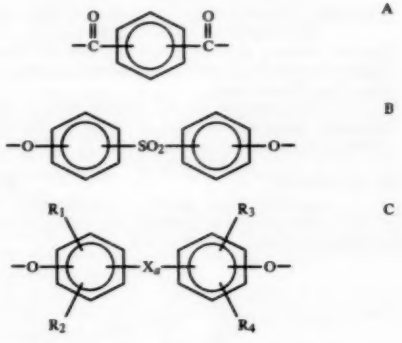
4,440,920

AROMATIC POLYESTERS

Shiro Fujikake; Motoo Kawamata, and Hikotada Tsuboi, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

PCT No. PCT/JP82/00142, § 371 Date Dec. 10, 1982, § 102(e) Date Dec. 10, 1982, PCT Pub. No. WO82/03867, PCT Pub. Date Nov. 11, 1982
PCT Filed Apr. 28, 1982, Ser. No. 453,893
Claims priority, application Japan, Apr. 30, 1981, 56-64255
Int. Cl.³ C08G *63/18, 63/66, 63/68*
U.S. Cl. 528—128 **5 Claims**

1. An aromatic polyester comprising the structural units shown by the following formulae A, B and C:



wherein two carbonyl groups in formula A are in a meta or paraposition with each other, an oxygen atom in formula B is in a meta or paraposition with an SO_2 group, an oxygen atom in formula C is in a meta or paraposition to X, X in formula C represents a divalent hydrocarbon group having 1–10 carbon atoms, O, CO, S, SO or SO_2, a is 0 or 1, and R_1 to R_4 are the same or different and each represent hydrogen, a hydrocarbon group having 1–8 carbon atoms or a halogen atom with a proviso that when X is SO_2, it is excluded that all of R_1 to R_4 are hydrogen, a ratio of the number of structural unit A to the number of structural unit B being 1:0.36–1.06, a ratio of the number of structural unit A to the number of structural unit C being 1:0.04–0.66, a ratio of the number of structural unit A to the number of structural units B and C being 1:0.99–1.10 and logarithmic viscosity number of the polymer being 0.2–2.0.

4,440,921

COUPLING OF POLYORGANOPHOSPHAZENES TO CARBOXYLIC ACID

Harry R. Allcock; Thomas X. Neenan, both of State College, and Walter C. Kossa, Wilkes-Barre, all of Pa., assignors to Research Corporation, Tucson, Ariz.

Filed Jun. 21, 1982, Ser. No. 390,350

Int. Cl.³ C08G 73/00, 79/02

U.S. Cl. 528—168 32 Claims

1. A carboxylated phosphazene polymer, comprising a phosphazene polymer backbone covalently coupled to a carboxylate-containing compound through a linking group attached at one end to said carboxylate-containing compound by an amide bond formed at a primary aliphatic amino group of said linking group and at the other end of said linking group to a phosphorous of said backbone.

4,440,922

POLYESTER CONTAINERS HAVING IMPROVED GAS BARRIER PROPERTIES

Robert B. Barbee, and Thomas H. Wicker, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Co., Rochester, N.Y.

Filed Apr. 13, 1983, Ser. No. 484,402

Int. Cl.³ C08G 63/66

U.S. Cl. 528—194 10 Claims

1. A container having improved gas barrier properties consisting essentially of a substantially thermoplastic polyester which consists essentially of the reaction product of

(A) a diol containing up to about 8 carbon atoms, and

(B) a diacid component consisting essentially of

(i) about 5 to 100 mole percent of a first diacid selected from the group consisting of 1,4-phenylenedioxy diacetic acid, 1,3-phenylenedioxy diacetic acid, 1,2-phenylenedioxy diacetic acid, and mixtures thereof, and

(ii) 0 to about 95 mole percent of terephthalic acid,

wherein said polyester has an inherent viscosity of about 0.5 to 1.5.

4,440,923

METHOD OF PRODUCING HIGH-MOLECULAR WEIGHT POLYPHENYLENE OXIDES

Martin Bartmann, Recklinghausen; Hanns-Jorg Bax; Klaus Burzin, both of Marl, and Wilfried Ribbing, Dorsten, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

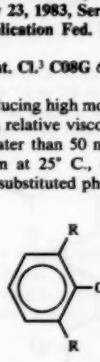
Filed May 23, 1983, Ser. No. 497,236

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224691

Int. Cl.³ C08G 65/44

U.S. Cl. 528—216 14 Claims

1. A method of producing high molecular-weight polyphenylene oxides, having a relative viscosity change in relation to the concentration greater than 50 ml/g, measured in a 0.5% solution in chloroform at 25° C., comprising the oxidative coupling of a diortho-substituted phenol having the formula:



wherein R is an n-alkyl radical with 1 to 6 carbon atoms or an aryl radical, in the presence of an oxidizing agent, an organic solvent, a copper-amine catalyst which comprises a copper salt and an amine, and an activator, which comprises a polyvalent alcohol and a 20 to 60% solution suspension of an alkali or alkaline earth hydroxide, in a temperature range of 20° to 80° C., wherein X moles of alkali or alkaline earth hydroxide, and y moles of polyvalent alcohol are used per 100 moles of said phenol, wherein $1<X<25$ and $1<Y<30$.

4,440,924

PROCESS FOR PRODUCTION OF POLYESTER

Katsuaki Kuze; Yuziro Matsuyama; Hiroshi Hashimoto, all of Shiga; Takeshi Ohta, Tsuruga, and Osamu Makimura, Ogaki, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Sep. 15, 1983, Ser. No. 532,624

Claims priority, application Japan, Oct. 5, 1982, 57-175895; Oct. 5, 1982, 57-175896; Oct. 7, 1982, 57-176682; Oct. 14, 1982, 57-180663

Int. Cl.³ C08G 63/30

U.S. Cl. 528—275 5 Claims

1. A process for production of a polyester comprising units of ethylene terephthalate as the major repeating units by supplying terephthalic acid and ethylene glycol continuously or intermittently to bis(beta-hydroxyethyl) terephthalate or its oligomer so as to carry out esterification under a pressure of not more than about 1.0 kg/cm², followed by polycondensation, which is characterized in that at least one magnesium compound is incorporated into the reaction system in an amount of about 30 to 400 ppm in terms of Mg to the polyester when the esterification rate in the step of esterification reaches about 20–80% and at least one phosphorus compound is incorporated into the reaction system in an amount as satisfying the following equation (I) at the stage after the esterification rate reaches not less than about 91% and before the termination of the initial condensation in the step of esterification:

$$1.2 \leq Mg/P \leq 20 \quad (I)$$

wherein Mg/P is the atomic ratio of the magnesium atom to the phosphorus atom.

4,440,925

PROCESS FOR MAKING FINE PARTICULATE NON-AGGLOMERATING CHLOROPOLYETHYLENE

Alexander Ohorodnik, Erftstadt; Hans W. Keuper, Cologne; Horst Semmler; Joachim Hardel, both of Brühl; Hermann Vierling, Hürth, and Robert Willms, Knapsack, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 9, 1982, Ser. No. 347,308

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 3105404

Int. Cl.³ C08F 8/22

U.S. Cl. 528—487 11 Claims

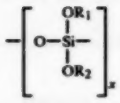
1. A process for making fine particulate, non-agglomerating chloropolyethylene by subjecting pulverulent polyethylene to a chlorination reaction in aqueous or aqueous/hydrochloric acid-suspension with chlorine gas at a temperature of about 20° to 140° C. in the presence of silicic acid and silicon oil, separating, washing and drying the chloropolyethylene, which comprises: terminating the chlorination; intensively mixing the aqueous/hydrochlorid acid suspension of chloropolyethylene with an aqueous or aqueous/hydrochlorid acid-dispersion containing

(A) about 2 to 6 weight % of talc,

(B) 0.05 to 1 weight % of a fixing agent consisting of

(a) an orthophosphoric acid monoester, an orthophosphoric acid diester or mixtures thereof wherein the ester radicals are alkyl radicals having 10 to 20 carbon atoms or polyoxyalkylene radicals having 4 to 20 carbon atoms or

(b) a polysiloxane of the general formula



in which R_1 and R_2 stand for alkyl, aryl or aralkyl radicals and x stands for a whole number of 10 to 10,000,

the percentages of (A) and (B) being based on the chloropolyethylene quantity and

(C) 0.3 to 2.5% by volume of a non-ionic dispersant, based on the volume of the chloropolyethylene suspension;

separating the chloropolyethylene from the mixture, washing with water and drying the chloropolyethylene.

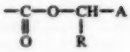
4,440,926

HEPARIN ESTERS AND PROCESSES FOR THEIR PREPARATION

Jean S. Mardiguian, La Varenne Saint-Hilaire, France, assignor to Pharmindustrie, Gennevilliers, France

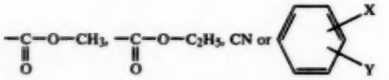
Filed Apr. 29, 1981, Ser. No. 258,811
Claims priority, application France, May 14, 1980, 80 10792
Int. Cl.³ C08B 37/10
U.S. Cl. 536—21 **15 Claims**

1. Esters of heparin, which are derived from heparin by replacement of the carboxyl groups of heparin by groups of the formula:



(I)

in which R is hydrogen or methyl and A is hydrogen, methyl, phenyl,



X representing chlorine, nitro, alkyl containing 1 to 4 carbon atoms or methoxy and Y representing hydrogen or chlorine, the replacement being a partial or total replacement when A is other than hydrogen, methyl or phenyl, and, when A is hydrogen, methyl or phenyl, the replacement being a partial replacement corresponding to a 10% to 90% esterification percentage of the carboxyl groups and the esters being selective esters wherein are esterified, partially or wholly, either only the carboxyl groups of the D-glucuronic acid linkages, only the carboxyl groups of the D-glucuronic acid and unsulfated L-iduronic acid linkages, only the carboxyl groups of the unsulfated L-iduronic acid and sulfated L-iduronic acid linkages, or only the carboxyl groups of the sulfated L-iduronic acid linkages, and the alkali metal, alkaline earth metal, magnesium, quaternary ammonium and triethylamine, pyridine and imidazole salts of said esters.

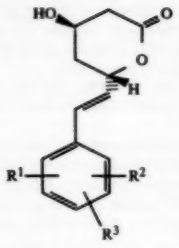
4,440,927

PROCESS FOR PREPARING INHIBITORS OF 3-HYDROXY-3-METHYLGLUTARYL COENZYME A REDUCTASE VIA A CHIRAL SYNTHON

John D. Prugh, Chalfont, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 275,521, Jun. 19, 1981, abandoned. This application May 3, 1982, Ser. No. 373,605
Int. Cl.³ C07D 309/30, 309/10
U.S. Cl. 549—292 **2 Claims**

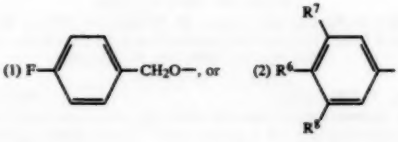
1. A process for preparing the compound of structural formula:



wherein:

R^2 and R^3 are independently chloro or C_{1-3} alkyl; and

R^1 is



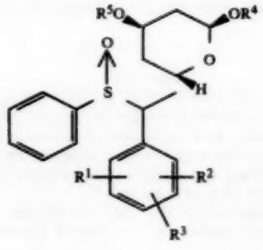
wherein

R^6 is hydrogen, fluoro- or chloro, and

R^7 and R^8 are independently hydrogen, chloro or C_{1-3} alkyl;

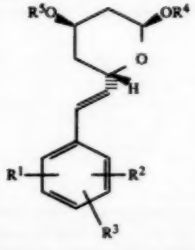
which comprises the steps of:

(A) treating a compound of structural formula:



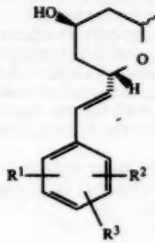
III

wherein R^4 is C_{1-3} alkyl; R^5 is benzyl, 4-fluorobenzyl, or 4-methoxybenzyl; at 45° to 80° C. for 2–12 hours in the presence of base in a liquid aromatic hydrocarbon; to produce the compound of formula:



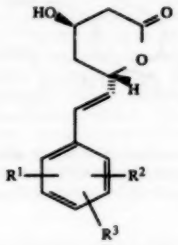
IV

(B) followed by treatment with palladium hydroxide on carbon catalyst in a C_{2-4} alkanol to remove the R^5 group followed by treatment with aqueous acetic acid to produce the compound of structure VI



VI

(C) followed by treatment with N-iodosuccinimide and tetra-n-butylammonium iodide in an inert solvent to produce the compound of formula



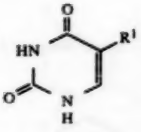
4,440,928

PROCESS FOR PREPARATION OF URACILS

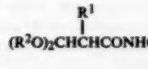
Kanenobu Matsui; Shinichiro Uchiumi; Hideki Asada, and Takashi Umezu, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Aug. 25, 1982, Ser. No. 411,464
Claims priority, application Japan, Sep. 1, 1981, 56-136145
Int. Cl.³ C07D 239/55
U.S. Cl. 544—309 10 Claims

2. A process for the preparation of uracils represented by the formula:



wherein R^1 stands for a hydrogen atom or an alkyl group having 1 to 6 carbon atoms,
which comprises cyclizing a 3,3-dialkoxypropionic acid derivative represented by the formula:



wherein R^1 is as defined above, and R^2 independently stand for an alkyl group having 1 to 8 carbon atoms or an aralkyl group having 7 to 9 carbon atoms,
in the presence of an acid catalyst.

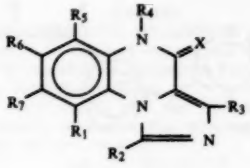
4,440,929

IMIDAZOQUINOXALINE COMPOUNDS

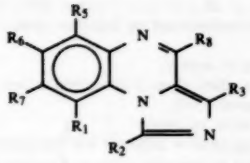
Thomas D. Lee, Scarsdale, N.Y., and Richard E. Brown, East Hanover, N.J., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 283,717, Jul. 16, 1981, abandoned. This application Mar. 29, 1982, Ser. No. 362,713
Int. Cl.³ C07D 487/04; A61K 31/495; C07D 233/90, 405/10
U.S. Cl. 544—346 16 Claims

1. Imidazoquinoxalines selected from the group consisting of structures I and II



I



II

wherein

R_1, R_5, R_6 and R_7 are independently H, alkyl, aryl, alkenyl, alknyl, hydroxy, hydroxyalkyl, alkoxy, mercapto, mercaptoalkyl, alkylthio, amino, alkylamino, aminoalkyl, carboxaldehyde,

wherein R_9 is H or pharmaceutically acceptable salts, carbalkoxy, alkanoyl, cyano, nitro, halo, trifluoromethyl, alkylsulfonyl, sulfonamido, or

R_1, R_5, R_6 or R_7 taken together with an adjacent group from a methylenedioxy group;

R_4 is H, alkyl, alkenyl, alkynyl, aryl, aralkyl, hydroxy or alkanoyl;

R_3 is H, cyano, tetrazolo, carboxaldehyde, hydroxyalkyl or

wherein Y is O or NH and R_{10} is H, alkyl, aryl, hydroxyalkyl, alkoxyalkyl, aminoalkyl or pharmaceutically acceptable salt thereof;

R_2 is H, alkyl, halo, amino, alkylamino, arylamino, hydroxyamino, hydroxy, alkoxy, mercapto, or alkylthio;

R_8 is alkyl, halo, amino, alkylamino, arylamino, hydroxyamino, hydroxy, alkoxy, mercapto, or alkylthio;

X is oxygen, sulfur, imino, or hydroxyimino;

with the proviso that when R_2 is hydroxy it can be in enol or keto form; and

wherein the alkyl of the alkyl, hydroxyalkyl, alkoxy, aminoalkyl, alkylamino, alkylthio, mercaptoalkyl, alkanoyl, aralkyl and carbalkoxy contains from 1 to 8 carbon atoms and

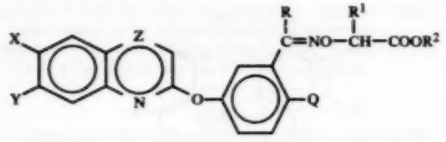
the alkenyl and alkynyl contain 2 to 8 carbon atoms.

4,440,930
HERBICIDALLY ACTIVE QUINOLINE OR QUINOXALINE ACETOPHENONE OXIME DERIVATIVES

Dennis K. Krass, Canal Fulton, and Sidney B. Richter, Fairlawn, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 25, 1982, Ser. No. 436,223
Int. Cl.[3] C07D *241/44, 215/22;* A01N *43/60, 43/42*
U.S. Cl. 544—354 3 Claims

1. A compound of the formula:



wherein:

R is hydrogen or alkyl of up to 3 carbon atoms which alkyl may be monosubstituted by halogen, cyano, alkoxy or alkylthio;

R^1 is hydrogen or methyl;

R^2 is hydrogen, alkyl of up to 10 carbon atoms or an agronomically suitable salt;

Q is halogen, nitro, or cyano;

X and Y are the same or different and represent hydrogen, halogen, alkyl or haloalkyl of up to 4 carbon atoms; and

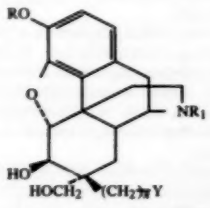
Z is nitrogen.

4,440,931
7β-ARYLALKYL-3-METHOXY OR 3-HYDROXY-4,5α-EPOXY-6β-HYDROXY-7α-HYDROXYMETHYL-17-METHYL OR 17-CYCLOALKYLMETHYLMORPHINANS

Michael P. Kotick; David L. Leland, and Joseph O. Polazzi, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 9, 1982, Ser. No. 416,146
Int. Cl.[3] C07D *489/02;* A61K *31/485*
U.S. Cl. 546—44 10 Claims

1. 7β-alkyl or arylalkyl-3-methoxy or hydroxy-4,5α-epoxy-6β-hydroxy-7α-hydroxymethyl-17-methyl or cycloalkylmethylmorphinans characterized by the formula:



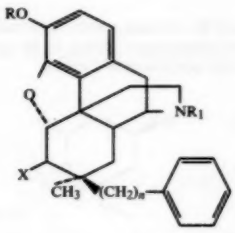
wherein R is H or methyl, R_1 is methyl, cyclopropylmethyl or cyclobutylmethyl, n is 2 to 4 and Y is H or phenyl.

4,440,932
7β-ARYLALKYL-7α-METHYL-6-OXO OR 6α-HYDROXY-3-METHOXY OR 3-HYDROXY-4,5α-EPOXY-17-METHYL OR 17-CYCLOALKYL-METHYLMORPHINANS

Michael P. Kotick, and David L. Leland, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 9, 1982, Ser. No. 416,145
Int. Cl.[3] C07D *489/02;* A61K *31/485*
U.S. Cl. 546—44 10 Claims

1. 7β-arylalkyl-7α-methyl-6-oxo or 6α-hydroxy-3-methoxy or 3-hydroxy-4,5α-epoxy-17-methyl or 17-cycloalkylmethylmorphinans of the formula:



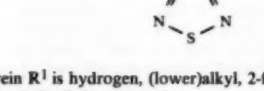
wherein R is H or methyl, X is oxo or α-hydroxy, n is 2 to 4 and R_1 is methyl, cyclopropylmethyl or cyclobutylmethyl.

4,440,933
PROCESS FOR PREPARING 1,2,5-THIADIAZOLES

Thomas A. Montzka, Manlius, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

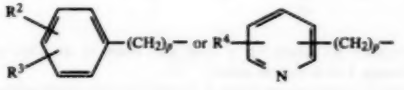
Filed Mar. 16, 1983, Ser. No. 475,985
Int. Cl.[3] C07D *285/10*
U.S. Cl. 546—193 9 Claims

1. A process for the preparation of a compound of the formula



I

wherein R^1 is hydrogen, (lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, allyl, propargyl,



in which

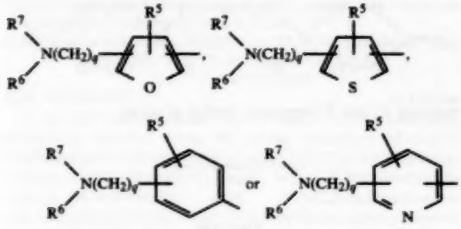
p is 1 or 2, R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkoxy or halogen, and, when R^2 is hydrogen, R^3 also may be trifluoromethyl, or R^2 and R^3, taken together, may be methylenedioxy, and R^4 is hydrogen, (lower)alkyl or (lower)alkoxy;

m is an integer of from 0 to 2 inclusive;

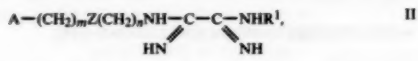
n is an integer of from 2 to 5 inclusive;

Z is oxygen, sulfur or methylene; and

A is



in which R^5 is hydrogen, (lower)alkyl or (lower)alkoxy, q is an integer of from 1 to 4 inclusive and R^6 and R^7 each are independently (lower)alkyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, or phenyl(lower)alkyl, and, when R^6 is hydrogen, R^7 also may be cyclo(lower)alkyl, or R^6 and R^7, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, homopiperidino, heptamethyleneimino, octamethyleneimino, 3-azabicyclo[3.2.2]non-3-yl or 3-pyrrolino; and nontoxic, pharmaceutically acceptable salts, hydrates and solvates thereof; which process comprises reacting a substituted ethanediimidamide of the formula

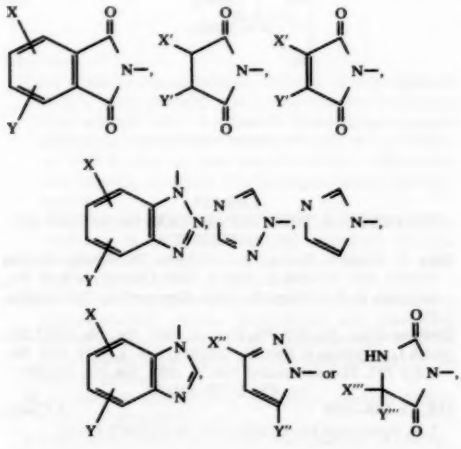


II

in which A, m, Z, n and R^1 are as described above, with a compound of the formula

VII

in which the two R groups are the same and may be



in which X and Y are independently hydrogen, (lower)alkyl, (lower)alkoxy, chloro, bromo, nitro, methanesulfonyl, benzenesulfonyl, cyclo(lower)alkyl or phenyl, X' and Y' are independently hydrogen, (lower)alkyl or phenyl, X'' and Y'' are independently hydrogen or (lower)alkyl and X''' and Y''' are independently (lower)alkyl or phenyl, in a non-reactive organic solvent, at a temperature of from about 0° C. to about 100° C.

9. A process for the preparation of 3-amino-4-[3-(4-piperidinomethyl-2-pyridyloxy)propylamino]-1,2,5-thiadiazole, or a nontoxic pharmaceutically acceptable salt, hydrate or solvate thereof, which comprises reacting N-[3-(4-piperidinomethyl-2-pyridyloxy)propyl]ethanediimidamide with about an equimolar amount of N,N'-thiobisphthalimide in a non-reactive organic solvent at a temperature of from about 10° C. to about 50° C.

4,440,934

5-(4-HYDROXYPHENYL) HYDANTOIN DERIVATIVES

Sung J. Kim; Ik W. Um, both of Seoul, and Won J. Park, Anyang, all of Rep. of Korea, assignors to Pacific Chemical Ind. Co., Ltd., Seoul, Rep. of Korea

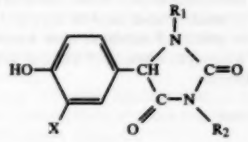
Filed Aug. 26, 1982, Ser. No. 411,783

Claims priority, application Rep. of Korea, Aug. 26, 1981, 81-3119; Apr. 30, 1982, 82-1902

Int. Cl.³ C07D *233/78*

U.S. Cl. 548—312 **4 Claims**

1. A 5-(4-hydroxyphenyl)hydantoin derivative of the formula(I)



(I)

wherein R_1 represents a hydrogen atom or a 1-hydroxy lower alkyl radical, and R_2 represents a 1-hydroxy lower alkyl radical, and X represents a hydrogen or chlorine atom.

4,440,935

BICYCLOIMIDAZOLES

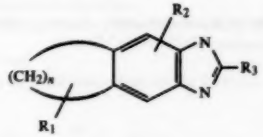
Fu-chih Huang, Boonton, N.J., assignor to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Division of Ser. No. 285,216, Jul. 7, 1981, Pat. No. 4,368,201. This application Sep. 20, 1982, Ser. No. 420,076

Int. Cl.³ A61K *31/425*; C07D *235/24*

U.S. Cl. 548—326 **2 Claims**

1. A compound of the structure



wherein

n is 3, 4, or 5

R_1 is hydrogen or C_1–C_6 alkyl,

R_2 is hydrogen, C_1–C_6 alkyl, hydroxyl, C_1–C_6 alkoxy, cyano, phenyl, carboxyl, tetrazole, or halogen,

R_3 is tetrazole, carboxamide or

wherein

Z is oxygen, sulfur or NH and

R_4 is H, alkali metal, ammonium, C_1–C_6 alkyl, C_1–C_6 alkoxy C_1–C_6 alkyl, C_6 aryl, or C_6 aryl C_1–C_6 alkyl.

4,440,936

RHODIUM-PHOSPHINE CHIRAL HYDROGENATION CATALYSIS OF ACETOPHENONE, ATROPIC ACID, AND ALPHA-ACYLAMIDOACRYLIC ACIDS AND ESTERS THEREOF

Dennis P. Riley, Forest Park, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

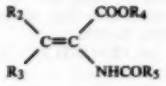
Division of Ser. No. 132,475, Mar. 19, 1980, Pat. No. 4,331,818. This application Jan. 18, 1982, Ser. No. 339,913

Int. Cl.³ C07D *209/20*; **C07C** *65/13, 101/04, 103/00*

U.S. Cl. 548—498 **15 Claims**

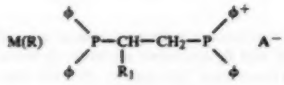
1. In a method for chiral hydrogenation of a prochiral substrate, which includes the steps of:

(a) providing a prochiral substrate selected from the group consisting of acetophenone, atropic acid, alpha-acylamido acrylic acids and esters thereof of formula:

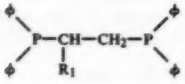


wherein R_2 and R_3 are —H, or substituted or unsubstituted alkyl, cycloalkyl or aryl, R_4 is —H or aryl, and R_5 is substituted or unsubstituted alkyl or aryl; and

(b) reacting the prochiral substrate with hydrogen in the presence of a catalytic amount of a chiral hydrogenation catalyst of formula:



wherein M is a transition metal, R is a chelating diene, A^- is a non-coordinating anion and



is the (S)- or (R)- stereoisomer; the improvement wherein R_1 is cyclohexyl.

4,440,937

CYCLIC CARBONIC ACID DERIVATIVES

Heinrich Krimm, and Hans-Josef Buysch, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

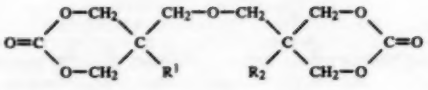
Filed Jan. 20, 1982, Ser. No. 340,943

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1981, 3103136; Jan. 30, 1981, 3103138; Jan. 30, 1981, 3103139

Int. Cl.³ C07D *319/06*

U.S. Cl. 549—228 **2 Claims**

1. A compound of the formula



wherein R^1 and R^2 represent methyl or ethyl.

4,440,938

PROCESS FOR THE PREPARATION OF A FURAN DERIVATIVE

John Bradshaw, Hertfordshire, England, assignor to Glaxo Group Limited, London, England

Continuation of Ser. No. 223,483, Jan. 8, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,600

Claims priority, application United Kingdom, Jan. 8, 1980, 8000580; Jan. 8, 1980, 8000581

Int. Cl.³ C07D *307/52*

U.S. Cl. 549—495 **5 Claims**

1. A process for the preparation of the furan derivative of formula (I)

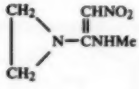
(I)

which comprises reacting a thiol of formula (II)

(II)

with an alkylating agent of formula (III)

(III)



4,440,939

PROCESS FOR THE PREPARATION OF ESTERS OF LEUKOTRIENE A

John G. Gleason, Delran, N.J.; Charles M. Kinzig, Merion Station, and Deborah L. Bryan, West Chester, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

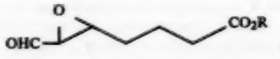
Division of Ser. No. 333,850, Dec. 22, 1981, Pat. No. 4,387,239, which is a division of Ser. No. 230,915, Feb. 2, 1981, Pat. No. 4,352,757. This application Nov. 4, 1982, Ser. No. 439,088

Int. Cl.³ C07D *303/42*

U.S. Cl. 549—548 **2 Claims**

1. A compound by the following structural formula:

(IV)



wherein R is alkyl of 1 to 4 carbon atoms, benzyl or 1,1,1-trichloroethyl.

4,440,940
ANTI-ATHEROSCLEROTIC AGENTS

Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 85,652, Oct. 17, 1979, abandoned. This application Nov. 19, 1981, Ser. No. 323,522
Int. Cl.³ C07C 101/00
U.S. Cl. 560—19 16 Claims

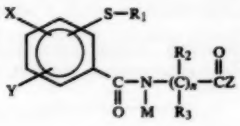
1. An acid containing the organic radical (2,3-methanoheptyl-4-ylamino) selected from the group consisting of 3-(2,3-methanoheptyl-4-ylamino)benzoic acid, 3-[3-(2,3,-methanoheptyl-4-ylamino)phenyl]propionic acid, 4-[3-(2,3,-methanoheptyl-4-ylamino)phenyl]butyric acid, 3-[3-(2,3-methanoheptyl-4-ylamino)phenyl]acrylic acid, 3-(2,3-methanoheptyl-4-ylamino)-phenylpropionic acid, 3-(2,3,-methanoheptyl-4-ylamino)benzoylacetic acid, 3-[3-(2,3,-methanoheptyl-4-ylamino)benzoyl]-propionic acid, and 2-(2,3,-methanoheptyl-4-ylamino)benzoylacetic acid.

4,440,941
AROYL-AMINOACIDS, AMIDES AND ESTERS THEREOF

John T. Suh, Greenwich, Conn.; Paul R. Menard, Tuckahoe, N.Y., and Howard Jones, Holmdel, N.J., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Dec. 22, 1980, Ser. No. 219,051
Int. Cl.³ C07C 63/04, 69/84
U.S. Cl. 560—20 12 Claims

1. A compound of the structure



wherein:

X and Y are hydrogen, halogen, hydroxy, alkoxy, trifluoromethyl, nitro, carboxy, cyano, sulfonamido, sulfhydryl, alkyl, alkenyl, alkynyl, alkanoyl, alkylmercapto, amino, alkylamino, dialkylamino, and may be the same or different with the proviso that when X is nitro, sulfonamido, alkyl, alkenyl, or alkynyl Y is hydrogen, halo or trifluoromethyl;

R_1 is hydrogen, alkanoyl, substituted alkanoyl wherein the substituent is hydroxy, amino or cycloalkyl, benzoyl, phenylalkanoyl, or cycloalkylcarbonyl;

n is an integer from 1 to 4 inclusive;

R_2 and R_3 are hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkyl-alkyl, phenyl, phenylalkyl, and substituted derivatives thereof wherein the substituents are hydroxy, amino, halogen, mercapto, alkylmercapto, and may be the same or different;

M is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkyl-alkyl, phenyl or phenylalkyl; and

Z is hydroxy, amino, alkylamino, dialkylamino, or alkoxy, wherein the alkyl, alkenyl, and alkynyl groups and the alkyl moieties in alkoxy, alkanoyl, alkylmercapto, alkylamino, and dialkylamino contain from 1 to 6 carbon atoms, the cycloalkyl groups contain from 3 to 7 carbon atoms, and where Z is hydroxy, their pharmaceutically acceptable, nontoxic alkali and alkaline earth salts.

4,440,942
CRYSTALLINE DIASTEREOMERIC L-ALPHA-METHYLDOPA POE ESTER AND PROCESS FOR ITS PREPARATION

John Budavari, Watchung, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 1, 1982, Ser. No. 353,697
Int. Cl.³ C07C 101/08
U.S. Cl. 560—40 16 Claims

1. Crystalline, diastereomeric L-α-methyldopa POE ester, also referred to as (R),(S)-α-pivaloyloxyethyl-(S)-3-(3,4-dihydroxyphenyl)-2-methylalaninate.

2. A process for isolating in a crystalline form, diastereomeric L-α-methyldopa POE ester from its crude reaction mixture which comprises:

(A) bringing said crude reaction mixture comprising diastereomeric L-α-methyldopa POE ester and an aprotic solvent to room temperature and diluting by up to about four times by volume with an inert organic solvent.

(B) extracting the organic solvent solution with an aqueous inorganic salt solution of ionic solution strength of from 5% (by weight) to saturated,

(C) finally, adding from about 0.5 to 5 volumes of an apolar solvent, aging the slurry, and collecting the resulting crystalline product.

16. The crystalline mixture, diastereomeric L-α-methyldopa POE ester, isolated from a crude reaction mixture comprising diastereomeric L-α-methyldopa POE ester, an aprotic solvent, unreacted starting materials and reaction by-products by the steps comprising:

(A) bringing said crude reaction mixture to room temperature and diluting by up to about four times by volume with an inert organic solvent,

(B) extracting the organic solvent solution with an aqueous inorganic salt solution of ionic solution strength of from 5% (by weight) to saturated,

(C) drying the organic solvent of Step (B) over a suitable drying agent,

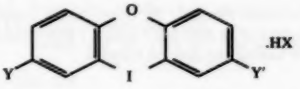
(D) finally, concentrating the organic phase, adding from about 0.5 to 5 volumes of an apolar solvent, adding seed crystals, aging the slurry.

4,440,943
PHENOXIODININ-5-IUM ANTIMICROBIAL COMPOUNDS

Edward E. Flagg, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 15, 1982, Ser. No. 358,148
Int. Cl.³ C07C 63/14
U.S. Cl. 560—65 22 Claims

1. A compound corresponding to the formula:

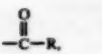


wherein X is an anion, and Y and Y' each independently represent:

(a)

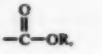
provided that when both Y and Y' are carboxyl, X is bromo;

(b)



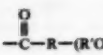
wherein R represents alkyl;

(c)



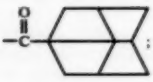
wherein R represents alkyl;

(d)



wherein R and R′ are each independently alkyl, and m is an integer of from one to six, both inclusive;

(e) adamantanoyl, i.e.,



(f)

wherein T represents:
phenylalkylether;

(g)

$-SO_2-Q$

wherein Q represents:
(1) halo or
(2) mono or dialkyl-substituted amino.

4,440,944

FIRE RETARDANT EPOXY RESINS CONTAINING 3-HYDROXYALKYLPHOSPHINE OXIDES

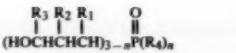
Edward R. Fretz, Jr., East Windsor, and Joseph Green, East Brunswick, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 369,786, Apr. 19, 1982, Pat. No. 4,380,571, which is a division of Ser. No. 264,256, May 18, 1981, Pat. No. 4,345,059. This application Feb. 3, 1983, Ser. No. 463,177

Int. Cl.³ C08G *59/62*

U.S. Cl. 560—76 **1 Claim**

1. A flame retardant hardener for epoxy resins comprising the reaction product of an anhydride with a 3-hydroxypropylphosphine oxide having the general formula:



wherein R_1 may be the same or a different radical selected from the group consisting of hydrogen, phenyl, hydroxymethyl and alkyl radicals of 1–4 carbon atoms, R_2 may be the same or a different radical selected from the group consisting of hydrogen, hydroxymethyl, and alkyl radicals of 1–4 carbon atoms, R_3 may be the same or a different radical selected from the group consisting of hydrogen and methyl radicals, R_4 is an alkyl radical 2–8 carbon atoms and n is either 0 or 1.

4,440,945

ANISOTROPIC HEAT-CURABLE ACETYLENE-TERMINATED MONOMERS AND THERMOSET RESINS PRODUCED THEREFROM

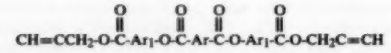
Anthony B. Conciatori, Chatham; Eui W. Choe, Randolph, and Gerald Farrow, New Providence, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,609

Int. Cl.³ C07C *69/82, 69/76, 69/80*

U.S. Cl. 560—86 **12 Claims**

1. Heat-curable acetylene-terminated monomers capable of forming an anisotropic melt phase of the formula:



wherein Ar is a divalent radical comprising at least one aromatic ring and Ar_1 is a divalent radical selected from the group consisting of phenylene, naphthylene, biphenylene and mixtures thereof with at least some of the hydrogen atoms present upon the aromatic rings in said divalent radicals optionally being replaced by substitution selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl and mixtures thereof.

4,440,946

PRODUCTION OF ESTERS FROM ALDEHYDES USING A SILVER/CADMIUM/ZINC/ZIRCONIUM CATALYST

Richard H. Summerville, deceased, late of W. Orange, N.J., and James E. Summerville, Jr., administrator, Signal Mountain, Tenn., assignors to Celanese Corporation, New York, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,607

Int. Cl.³ C07C *67/24;* **B01J** *23/06*

U.S. Cl. 560—210 **15 Claims**

1. A process for producing a carboxylate ester which comprises contacting a mixture of alcohol and aldehyde in vapor phase with a coprecipitate catalyst composition comprising silver-cadmium-zinc-zirconium which is substantially in the free metal form.

15. A coprecipitate catalyst composition comprising $Ag_{1.0}Cd_{0.1-1.5}Zn_{0.1-1}Zr_{0.5-2.0}K_{0-0.6}$ which is substantially in the free metal form.

4,440,947

PREPARATION OF SUBSTITUTED ALPHA-HALOGENO-PROPIONIC ACIDS AND THEIR DERIVATIVES

Dieter Arlt, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

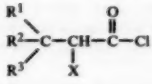
Filed Mar. 5, 1982, Ser. No. 355,042

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111848

Int. Cl.³ C07C *61/14, 51/04, 53/19, 17/04, 19/02*

U.S. Cl. 560—226 **14 Claims**

1. A process for the production of a substituted α-halogeno-propionic acid or derivative thereof of the formula



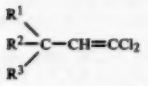
wherein

R^1 is a hydrogen or halogen atom, or an alkyl, halogen-substituted alkyl or aryl group,

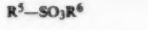
R^2 and R^3 each independently is a hydrogen or halogen atom or a methyl or ethyl group, and

X is a chlorine or bromine atom,

comprising reacting a substituted vinylidene chloride of the formula



with chlorine or bromine chloride in the presence of a compound of the formula



wherein

R^5 is an optionally halogen-substituted C_1 to C_{18} alkyl group, an optionally alkyl-substituted aryl group, a C_1 to C_8 alkoxy group, a chlorine or fluorine atom or a hydroxyl group, and

R^6 is a hydrogen atom or a methyl or ethyl group.

4,440,948

PROCESS FOR PREPARING METHACRYLIC ACID

Yoshio Oda; Keiichi Uchida; Takeshi Morimoto, and Seisaku Kumai, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 563,472, Mar. 31, 1975, Pat. No. 3,998,877. This application Sep. 22, 1976, Ser. No. 725,671

Claims priority, application Japan, Apr. 2, 1974, 49-36597; Apr. 2, 1974, 49-36598; Jul. 2, 1974, 49-74971

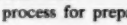
The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.³ C07C *51/25, 57/055*

U.S. Cl. 562—532 **12 Claims**

1. A process for preparing methacrylic acid, which comprises:

reacting methacrolein with molecular oxygen in the vapor phase at a temperature of from 230° C. to 450° C. in the presence of a catalyst consisting essentially of



wherein X is at least one member selected from the group consisting of Cs and Tl; Y is at least one member selected from the group consisting of V, Zr, Nb, Ni, Ta and Fe; $\alpha'=0.1-3$; $\beta'=0.2-9$; $\gamma'=0.1-7$ and $\delta'=36-100$, which contains a cesium or thallium phosphomolybdate structural component.

4,440,949

AMIDINOUREAS

George H. Douglas, Malvern; William L. Studt, Harleysville, and Stuart A. Dodson, Lansdale, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

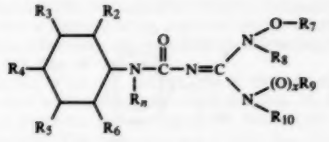
Continuation of Ser. No. 1,636, Jan. 8, 1979, Pat. No. 4,242,339, which is a division of Ser. No. 934,780, Aug. 18, 1978, Pat. No. 4,169,155, which is a division of Ser. No. 811,092, Jun. 17, 1977, Pat. No. 4,115,647, which is a division of Ser. No. 671,763, Mar. 30, 1976, Pat. No. 4,058,557. This application Dec. 30, 1980, Ser. No. 221,453

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.³ C07C *401/06, 99/02, 127/15, 127/19*

U.S. Cl. 564—48 **5 Claims**

1. A compound of the formula:



where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are:
hydrogen,
halo,
loweralkyl,
halololoweralkyl,
nitro,
amino,
acylamino,
hydroxy,
aralkyloxy or
loweralkoxy;

R_n is hydrogen or loweralkyl;

R_7, R_8, R_9 and R_{10} may be the same or different and are:
hydrogen,
alkyl,
alkenyl,
alkynyl,
cycloalkyl or
aralkyl;

R_7 and R_8 together and R_9 and R_{10} together may form a ring selected from the group consisting of isooxazolidine and isooxazine;

x is 0–1;

the sum total of carbon atoms present in R_7, R_8, R_9 and R_{10} together is less than twelve; and

the non-toxic acid addition salts thereof.

4,440,950

PROCESS FOR PREPARATION OF AMINOBENZALDEHYDES AND AMINOBENZYLKETONES

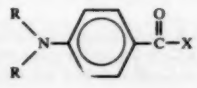
Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1982, Ser. No. 441,584

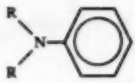
Int. Cl.³ C07C *85/18*

U.S. Cl. 564—305 **7 Claims**

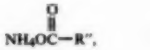
1. A process for the production of an N,N-dihydrocarbylaminobenzyldehyde or N,N-dihydrocarbylaminobenzylketone of the formula



consisting of (a) reacting an N,N-dihydrocarbylaniline of the formula



and a protected Schiff's base, derived from the reaction of ammonia and an aldehyde of the formula R'CHO, in the presence of a carboxylic acid of the formula R"COOH, an ammonium salt of a carboxylic acid of the formula



and water wherein R is a C_1 to C_{20} hydrocarbyl radical, R' is either H or a C_1 to C_9 hydrocarbyl radical, X is either H or a C_1 to C_{10} hydrocarbyl radical, and R" is either hydrogen or a C_1 to C_{10} hydrocarbyl radical, followed by (b) hydrolysis of the resulting product of (a).

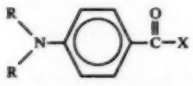
4,440,951

PROCESS FOR PREPARATION OF AMINOBENZALDEHYDES AND AMINOBENZYLKETONES

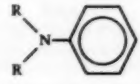
Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1982, Ser. No. 441,585
Int. Cl.³ C07C *85/18*
U.S. Cl. 564—305 **7 Claims**

1. A process for the production of N,N-dihydrocarbylaminobenzaldehyde or N,N-dihydrocarbylaminobenzylketone of the formula



consisting of reacting N,N-dihydrocarbylaniline of the formula



and a protected Schiff's base, derived from the reaction of ammonia and an aldehyde of the formula R'CHO, in the presence of a carboxylic acid of the formula R"COOH, an aromatic hydrocarbon of the formula

and water wherein R is a C_1 to C_8 hydrocarbyl radical, R' and X are either H or a C_1 to C_{10} hydrocarbyl radical, R" is either hydrogen or a C_1 to C_6 alkyl radical and n is a whole number from 0 to 6.

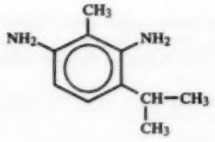
4,440,952

1-METHYL-2,6-DIAMINO-3-ISOPROPYL BENZENE

Kryn G. Ihrman, Farmington, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 403,289, Jul. 30, 1982, which is a continuation-in-part of Ser. No. 397,488, Jul. 12, 1982, abandoned. This application Sep. 29, 1982, Ser. No. 427,139
Int. Cl.³ C07C *87/58*
U.S. Cl. 564—305 **1 Claim**

1. The compound 1-methyl-2,6-diamino-3-isopropylbenzene:



4,440,953

PURIFICATION OF N-SUBSTITUTED AMINOBENZALDEHYDES

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 28, 1983, Ser. No. 489,447
Int. Cl.³ C07C *85/26*
U.S. Cl. 564—437 **11 Claims**

1. A process for recovering high purity N-substituted aminobenzaldehydes, from a material containing such compounds comprising the steps of:

(1) suspending crude aminobenzaldehyde in aqueous medium,

(2) contacting the product of step (1) with acid,

(3) separating insolubles from the product of step (2),

(4) neutralizing the soluble product of step (3) to form a precipitate, and

(5) recovering the precipitate of step (4).

4,440,954

PROCESS FOR THE PURIFICATION OF P-AMINOPHENOL

William R. Clingan, Ferguson; Edward L. Derrenbacker, Creve Coeur, and Thomas J. Dunn, Jefferson County, all of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 156,661, Jun. 5, 1980, abandoned. This application Apr. 20, 1981, Ser. No. 251,461
Int. Cl.³ C07C *89/04*
U.S. Cl. 564—439 **33 Claims**

1. A process for the recovery and extractive purification of p-aminophenol prepared by catalytic reduction of nitrobenzene in acid medium whereby 4,4'-diaminodiphenyl ether and aniline are present as impurities, the process comprising neutralizing an aqueous feed solution containing p-aminophenol and said impurities with a base to adjust the pH of said solution to between approximately 4.0 and 5.0, extracting the resulting aqueous feed solution with an organic solvent consisting of mixtures of aniline and toluene within the range between approximately 4 parts by volume aniline to 1 part by volume toluene and approximately 1 part by volume aniline to 4 parts by volume toluene whereby 4,4'-diaminodiphenyl ether is selectively extracted into said organic solvent and an aqueous phase containing principally p-aminophenol and an organic anilinetoluene phase containing p-aminophenol, 4,4'-diaminodiphenyl ether and other minor amine by-products are produced, separating said aqueous phase from said organic phase and thereafter recovering p-aminophenol of improved purity from said aqueous phase.

4,440,955

PROCESS FOR THE PREPARATION OF 2,2-DIMETHYL-3-VINYL-CYCLOPROPANECARBOXYLIC ACIDS AND ESTERS

Manfred Jautelat, Burscheid, and Dieter Arlt, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

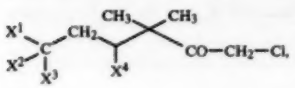
Division of Ser. No. 331,403, Dec. 16, 1981. This application Nov. 22, 1982, Ser. No. 443,840

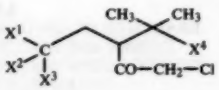
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1981, 3100354

Int. Cl.³ C07C *49/16*

U.S. Cl. 568—419 3 Claims

1. A compound selected from the group consisting of





and mixtures thereof,

in which

X^1 and X^2 each independently is a halogen atom or a fluorine-substituted alkyl group, and

X^3 and X^4 each independently is a halogen atom.

4,440,956

SELECTIVE HYDROGENATION OF ACETYLENES IN THE PRESENCE OF BUTADIENE AND CATALYST USED IN THE HYDROGENATION

Mark C. Couvillion, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 436,250, Oct. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 299,688, Sep. 8, 1981, abandoned. This application Mar. 8, 1983, Ser. No. 473,293

Int. Cl.³ B01J *23/68, 23/72, 23/84, 23/86*

U.S. Cl. 585—260 6 Claims

1. A catalyst for removing α-acetylenes from liquid hydrocarbon streams consisting essentially of a mixture of finely divided copper metal and minor amounts of at least one polyvalent activator metal selected from the group consisting of silver, platinum, palladium, manganese, cobalt, nickel, chromium and molybdenum, dispersed on an aluminum oxide support, said support being a gamma alumina as defined by the Joint Committee on Powder Diffraction Standards, #29–63, of high purity having a surface area of between about 68 and about 350 square meters per gram, and 90 to 60 percent of the pores have a pore diameter between about 40 Å and 120 Å and not more than 25 percent nor less than 2 percent have a pore diameter between 1000 Å to 10,000 Å, a silicone content as SiO_2 of less than about 0.15 weight %, a sodium content as Na_2O of less than about 0.15 weight %, a sulfur content less than about 0.01 weight % and an iron content as Fe_2O_3 of less than about 0.06 weight %, said gamma alumina may contain up to 35% by weight of alpha alumina.

4,440,957

PREPARATION OF β-ISOPROPYLNAPHTHALENE

Kurt Handrick; Georg Kölling, and Paul Kiedel, all of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 136,968, Apr. 3, 1980, abandoned, which is a continuation of Ser. No. 7,406, Jan. 29, 1979, abandoned, which is a continuation of Ser. No. 842,841, Oct. 3, 1977, abandoned. This application Aug. 3, 1981, Ser. No. 289,525

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644624

Int. Cl.³ C07C *2/68, 5/22*

U.S. Cl. 585—323 10 Claims

1. A continuous process for preparing β-isopropylnaphthalene comprising

(a) alkylating naphthalene with propylene by introducing these two compounds into a multiplicity of reaction zones at a temperature between about 150° and 280° C. and a pressure between about 5 and 30 atm in the absence of a normally liquid solvent and in the presence of a phosphoric acid catalyst supported on a SiO_2, this introduction being effected in amounts to obtain a mol ratio of 1/5 to 1/20 mol of propylene to 1 mol of naphthalene in each reaction zone until 45 to 65% of the naphthalene are converted in the entire alkylating reaction to an isomeric mixture of α- and β-isopropylnaphthalene, then

(b) charging said isomeric mixture into an isomerization zone wherein said mixture is heated to a temperature between about 180° and 280° C. at an inert gas pressure of between about 5 and 30 atm and in contact with said phosphoric acid catalyst supported on SiO_2 until no further β-isopropylnaphthalene is formed,

(c) whereupon the β-isopropylnaphthalene is recovered from the isomerization zone at a purity of about 90 to 95%.

4,440,958

METHOD FOR PROMOTING THE ACTIVITY OF CATION-EXCHANGEABLE LAYERED CLAY AND ZEOLITE CATALYSTS IN PROTON-CATALYSED REACTIONS

Reginald Gregory, Camberley, and David J. Westlake, Woking, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Jul. 29, 1981, Ser. No. 288,019

Claims priority, application United Kingdom, Aug. 1, 1980, 8025259

Int. Cl.³ C01C *67/04*

U.S. Cl. 560—247 13 Claims

1. A method for promoting the activity of a cation-exchangeable layered clay or a zeolite catalyst in an esterification reaction which comprises carrying out such as reaction in the presence of said catalyst and in the presence of a strong acid.

2. A method for promoting the activity of a cation-exchangeable layered clay or a zeolite catalyst in an esterification reacton which comprises reacting an olefin with a carboxylic acid in the presence of said catalyst and a strong acid.

3. A method according to claim 2 wherein the carboxylic acid is acetic and the ester produced is ethyl acetate.

7. A method according to claim 1, 2 or 3 wherein the strong acid is either sulphuric acid, phosphoric acid, hydrochloric acid, hydrofluoric acid or para-toluene solphonic acid.

4,440,959

PROCESS FOR THE MANUFACTURE OF CHLOROACETALDEHYDE DIMETHYL ACETAL

Wolfgang Deinhammer, Burghausen, Fed. Rep. of Germany, assignor to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 1, 1982, Ser. No. 437,909

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149652

Int. Cl.³ C07C *41/48, 41/58*

U.S. Cl. 568—604 5 Claims

1. In a process for the manufacture of chloroacetaldehyde dimethyl acetal including the steps of reacting vinyl acetate and chlorine in stoichiometric amounts in the presence of excess methanol at temperatures of less than 20° C., and subsequently separating off the chloroacetaldehyde dimethyl acetal from the reaction mixture, the improvement comprising the steps of:

distilling off at least partially the low-boiling constituents having boiling points of up to 60° C. from the reaction mixture when the addition of chlorine is complete, under the pressure of the surrounding atmosphere, thereby producing a liquid residue;

neutralizing the liquid residue with solid substances selected from the group consisting of the oxides and carbonates of metals of Group IIa of the Periodic Table and a combination thereof, while maintaining a temperature of from 20° to 60° C., so as to produce a phase separation with an organic upper layer;

separating off the organic upper layer after phase separation is complete, to produce a crude product; and

purifying the crude product by distillation to produce relatively pure chloroacetaldehyde dimethyl acetal.

4,440,960

CONTINUOUS PREPARATION OF 3-ALKYL-BUTEN-1-ALS

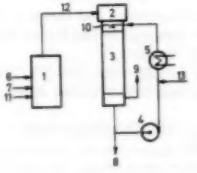
Wolfgang Sauer, Kirchheimbolanden; Werner Aquila, Mannheim; Wolfgang Hoffmann, Frankenthal; Karl Brenner, Ludwigshafen, and Klaus Halbritter, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 11, 1981, Ser. No. 330,024

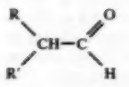
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1980, 3049543

Int. Cl.³ C07C *45/29*

U.S. Cl. 568—471 3 Claims

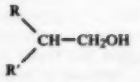


1. A process for the continuous preparation of 3-alkyl-buten-1-als of the formula



I

where R is hydrogen and R′ is $H_2C{=}C(CH_3)—$, or R and R′ together are $H_3C—C(CH_3){=}$, by oxidative dehydrogenation of 3-alkyl-buten-1-ols of the formula



II

where R and R′ have the above meanings, by passing these compounds and oxygen over a catalyst containing copper and/or silver at from 320° to 650° C., condensing the reaction gases and separating off the 3-alkyl-buten-1-als, wherein, within one second after contact with the catalyst, the vaporous reaction mixture, which is at from 320° to 650° C., is brought into contact with a liquid comprising water and/or the condensed reaction mixture at from −20° to 50° C., and the 3-alkyl-buten-1-als are separated off from the resulting condensate.

4,440,961

BRANCHED CHAIN OLEFINIC ALCOHOLS, THIOLS, ESTERS AND ETHERS, ORGANOLEPTIC USES THEREOF, PROCESSES FOR PREPARING SAME AND INTERMEDIATES THEREFOR

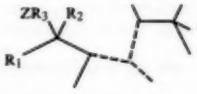
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 322,734, Nov. 19, 1981, Pat. No. 4,375,505, which is a continuation-in-part of Ser. No. 212,887, Dec. 4, 1980, Pat. No. 4,318,934. This application Sep. 23, 1982, Ser. No. 422,525

Int. Cl.³ C07C *33/025, 69/007, 149/08, 153/09*

U.S. Cl. 568—840 7 Claims

1. A branched chain olefinic chalcogen derivative having the formula:



wherein Z represents oxygen or sulfur; wherein one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bonds; wherein R_1 represents C_1–C_4 alkyl; R_2 represents C_1–C_4 alkyl; R_3 represents hydrogen, MgX, Li, C_1–C_3 lower alkyl or C_1–C_3 lower acyl and wherein X represents chloro, bromo or iodo.

4,440,962

PROCESS FOR REMOVING NITROSATING AGENTS FROM 1-CHLORO-2,6-DINITRO-4-(TRIFLUOROMETHYL) BENZENE

Edoardo Pallucca, Settimo Milanese, Italy, assignor to Oxon Italia S.P.A., Milan, Italy

Filed Apr. 22, 1982, Ser. No. 370,746

Int. Cl.³ C07C *79/12*

U.S. Cl. 568—933 9 Claims

1. A process for removing nitrosating agents from 1-chloro-2,6-dinitro-4-(trifluoromethyl)benzene (DINITRO-PCBT), characterised in that DINITRO-PCBT is treated with an aqueous bisulphite solution having an SO_2 concentration of between 1% and 5% at a pH of between 1 and 3, at a temperature of between 50° and 100° C. for a time of between 1 and 3 hours, and in that the organic layer is separated from the aqueous layer, and the acidity and last traces of the bisulphite solution are eliminated from the organic layer by an aqueous alkaline solution.

4,440,963

PRODUCTION OF MTBE AND ETBE

William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 9, 1982, Ser. No. 406,154
Int. Cl.³ C07C 41/05, 41/38
U.S. Cl. 568—697 12 Claims

1. A process for the production of MTBE which comprises reacting methanol and isobutene under reaction conditions to form a methanol-containing methyl-tertiary butyl ether reactor effluent stream comprising unreacted isobutylene, unreacted methanol, and product methyl tertiary butyl ether, and

fractionating said MTBE reactor effluent stream in admixture with an azeotroping component selected from the group consisting of 2-methylpentane and 1,1,2-trichloro-1,2,2-trifluoroethane, thereby taking unreacted methanol as an azeotropic overhead stream, wherein said overhead stream further contains unreacted isobutylene, and taking as product methyl tertiary butyl ether as bottoms.

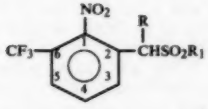
4,440,964

SUBSTITUTED 2-ALKYLSULFONYLALKYL NITROBENZENES AND PROCESS FOR THEIR PREPARATION

John P. Chupp, Kirkwood; Gerhard H. Alt, and Terry M. Balthazor, both of University City, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 17, 1982, Ser. No. 358,774
Int. Cl.³ C07C 131/00
U.S. Cl. 568—30 10 Claims

1. Compounds having the formula



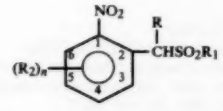
I

wherein

R is hydrogen or methyl;

R_1 is C_{1-6} alkyl, phenyl or phenyl substituted with C_{1-6} alkyl or alkoxy or halogen.

4. Process for preparing compounds having the formula



I

wherein

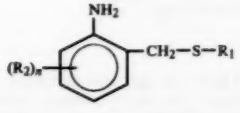
R is C_{1-6} alkyl or alkanoyl, formyl or alkenyl or alkynyl having up to 4 carbon atoms;

R_1 is C_{1-6} alkyl, phenyl or phenyl substituted with C_{1-6} alkyl or alkoxy or halogen;

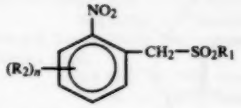
R_2 is independently hydrogen or the same as R or R_1, NO_2, CN, CF_3 or C_{1-6} alkoxy or alkoxycarbonyl and

n is 0–4, which comprises the steps of

(a) reacting a compound having the formula



wherein R_1, R_2 and n are as defined above, with a peracid to form



II

wherein R_1, R_2 and n are as defined above;

(b) reacting the product of step (a) with a compound of the formula

RZ III

in the presence of a base selected from the group consisting of alkali or alkaline earth oxides or hydroxides wherein R is as defined above except hydrogen; and Z is sulfate or tosylate radical or a halogen atom or RZ is a 1,4-Michael addition agent.

4,440,965

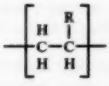
POLYMER LUBRICANTS

Richard F. Palmer, Camas, Wash., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1982, Ser. No. 379,406
Int. Cl.³ C07C 1/16
U.S. Cl. 585—12 13 Claims

1. A lubrication method which comprises positioning between two surfaces, at least one of which is movable with respect to the other, a lubricant to reduce friction between said surfaces; wherein said lubricant is of the formula

where A is a negative ion; wherein n is a whole number greater than 2; wherein each R in each



group is independently selected from the group consisting of H and $-CH_2CH_3$ such that at least about 60% of the R's are CH_2CH_3; and wherein the average molecular weight of said lubricant is within the range of about 150 to about 3,000.

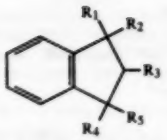
4,440,966

PRODUCTION OF INDANES

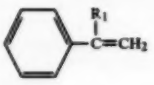
Gerald J. Ferber, Ilford, and Peter J. Goddard, Luton, both of England, assignors to Bush Boake Allen, London, England

Filed Mar. 11, 1982, Ser. No. 357,189
Claims priority, application United Kingdom, Mar. 13, 1981, 8108050
Int. Cl.³ C07C 3/00, 3/50, 3/54
U.S. Cl. 585—415 17 Claims

1. A process for the production of an indane of the formula:



wherein R_3 represents a hydrogen atom or a methyl group; at least one of R_1 and R_2 represents a methyl group and the other represents a hydrogen atom or a methyl group; and R_4 and R_5 which may be the same or different represent alkyl groups having from 1 to 3 carbon atoms, which comprises; reacting a styrene with an alkene in the presence of an acid catalyst to form a reaction product mixture containing said indane, characterised in that the styrene is a compound of the formula:



wherein R_1 represents a hydrogen atom or a methyl group; the alkene is selected from the group consisting of propylene, 2-methyl-but-1-ene, 2-methyl-but-2-ene, 2-methyl-pent-1-ene, 2-methyl-pent-2-ene, 3-methyl-but-1-ene, isobutylene and diisobutylene, and the acid catalyst consists essentially of an aqueous solution of phosphoric acid which comprises above 85% w/w phosphoric acid.

4,440,967

CATALYST AND REVERSE DISPROPORTIONATION PROCESS

Charles F. Hobbs, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 29, 1982, Ser. No. 402,874
Int. Cl.³ C07C *5/09*
U.S. Cl. 585—435 **13 Claims**

1. A process for the reverse disproportionation of stilbene and ethylene which comprises contacting stilbene and ethylene at reverse disproportionation conditions with an activated catalyst containing catalytically-effective amounts of cobalt, tungsten, and an alkali or alkaline earth component or compounds thereof supported on a carrier material, to produce styrene.

4,440,968

CATALYST AND REVERSE DISPROPORTIONATION PROCESS

Charles F. Hobbs, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 29, 1982, Ser. No. 403,253
Int. Cl.³ C07C *5/09*
U.S. Cl. 585—435 **13 Claims**

1. A process for the reverse disproportionation of stilbene and ethylene which comprises contacting stilbene and ethylene at reverse disproportionation conditions with an activated catalyst containing catalytically-effective amounts of iridium, tungsten, and an alkali or alkaline earth component or compounds thereof supported on a carrier material, to produce styrene.

4,440,969

PURIFICATION OF OLEFINS BY BORON TRIFLUORIDE-ALCOHOL TREATMENT

William A. Sweeney, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 28, 1982, Ser. No. 382,904
Int. Cl.³ C07C *7/10*
U.S. Cl. 585—851 **9 Claims**

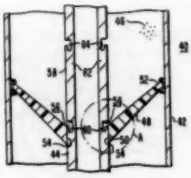
1. A process for purifying predominantly straight chain liquid olefins having from 5 to 50 carbon atoms which comprises contacting the olefins with a liquid solution of boron trifluoride in an alcohol or mixture of alcohols selected from the group consisting of mono and poly hydroxylic aliphatic compounds having from one to five carbon atoms, intimately admixing the liquid olefins and liquid solution of boron trifluoride, separating into two liquid layers, and recovering the olefin layer, under reaction conditions sufficient to minimize the olefinic reactions normally catalyzed by boron trifluoride while recovering an olefin product essentially free of color-forming impurities and impurities which retard or suppress further reaction of the olefins.

4,440,970

VERTICALLY ALIGNED GAS-INSULATED TRANSMISSION LINE HAVING PARTICLE TRAPS AT THE INNER CONDUCTOR

Steinar J. Dale, Monroeville, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 10, 1982, Ser. No. 356,686
Int. Cl.³ H01B 9/06, 9/04; H02G 5/06
U.S. Cl. 174—14 R 6 Claims



1. A gas-insulated transmission line, comprising:

an outer conductor;

a tubular inner conductor adapted for connection to an external energizing source disposed interiorly within said outer conductor, said tubular inner conductor having a wall thickness and a hollow interior;

an insulating gas disposed within the space between said outer and inner conductors;

support means for insulatably supporting said inner conductor within said outer conductor; and

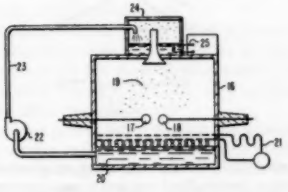
particle trapping means for trapping foreign particles disposed along said inner conductor, said particle trapping means comprising said inner conductor wall having a circumferentially disposed cavity formed therein open facing said outer conductor, said cavity extending radially inwardly a distance less than the wall thickness of said inner conductor such that said cavity and the hollow interior of said inner conductor are separated by a portion of said inner conductor wall.

4,440,971

SUPERSATURATED VAPOR DIELECTRICS

Ronald T. Harrold, Murrysville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 24, 1982, Ser. No. 381,094
Int. Cl.³ H01B 3/20
U.S. Cl. 174—17 GF 12 Claims



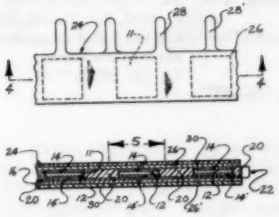
1. Apparatus with high electrical breakdown strength comprising a chamber containing electrodes separated by a substantially droplet-free dielectric gas supersaturated with the vapors of a dielectric liquid, and means to effect said supersaturation without atomization of said dielectric liquid.

4,440,972

MINIATURIZED BUS BAR WITH CAPACITORS AND METHOD OF MAKING SAME

Michael J. Taylor, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Mar. 31, 1981, Ser. No. 249,394
Int. Cl.³ H01B 7/00, 13/00
U.S. Cl. 174—72 B 13 Claims



1. A high capacitance multilayer bus bar assembly comprising:

a pair of spatially separated conductors, said conductors having inwardly facing planar surfaces;

capacitor ribbon means positioned between said conductors, said ribbon means having a pair of outwardly facing planar surfaces, said ribbon means comprising a plurality of spatially separated discrete capacitors embedded within an insulating material, said capacitors each having a pair of oppositely disposed planar conductive surfaces, said conductive surfaces being exposed at and in part defining said planar surfaces of said ribbon means, said conductive surfaces being electrically connected to respective of said conductor inwardly facing surfaces;

an elongated electrically conductive strip, said strip being affixed to at least one of said ribbon means planar surfaces, said strip being in electrical contact with said conductive surfaces of said capacitors at said one planar surface and with the inwardly facing surface of the adjacent one of said conductors; and

means for retaining said capacitor conductive surfaces electrically connected to said respective conductor inwardly facing surfaces.

11. A method of forming a high capacitance bus bar assembly comprising the following steps:

selecting a plurality of substantially identical capacitive elements each comprising a wafer of dielectic material with a pair of conductively coated opposed surfaces;

positioning a substrate within a frame;

arranging the capacitive elements in a linear array upon the substrate with one of said conductively coated surfaces of each capacitive element facing the substrate and the other of said conductively coated surfaces facing upward;

filling the frame with a curable electrical insulating material in uncured form to a level where the insulating material surrounds the capacitive elements with the upward facing conductively coated surfaces of the capacitive elements being free of the insulating material;

preventing the insulating material from covering the conductively coated surfaces of the capacitive elements;

curing the insulating material;

removing the frame;

shearing the insulating material to form a strip having a linear array of capacitive elements embedded therein; and

securing the strip between a pair of bus bar conductors with the conductive coated surfaces of the capacitive elements

being electrically connected to respective of the bus bar conductors.

4,440,973

COAXIAL CABLES

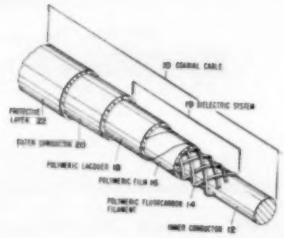
Richard E. Hawkins, Colchester, Vt., assignor to Champlain Cable Corporation, Wilmington, Del.

Continuation of Ser. No. 156,545, Jun. 5, 1980. This application Mar. 17, 1982, Ser. No. 358,955

The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.³ H01B 7/18

U.S. Cl. 174—107 9 Claims



1. A coaxial cable having improved strength properties over a wide temperature range, comprising:

(a) an inner conductor;

(b) a dielectric system comprising:

(i) a first layer of braided high tensile strength polymeric fluorocarbon filaments surrounding said inner conductor in an open weave along the length of the inner conductor, said filaments having a tensile strength of at least 40,000 psi and a dielectric constant of less than 2.8;

(ii) a second layer consisting of a polymeric film which remains stable at temperatures of up to 150° C. surrounding circumferentially the first layer and providing a continuous skin enclosing the first layer; and

(iii) a third layer consisting of a crosslinked polymeric lacquer surrounding circumferentially the second layer and providing a continuous skin enclosing the second layer;

(c) an outer conductor disposed circumferentially about the dielectric system; and

(d) an outer protective layer surrounding circumferentially the outer conductor.

9. A method of making a coaxial cable having improved strength properties over a wide temperature range, comprising:

(a) covering a metallic conductor circumferentially with a first layer of braided high tensile strength polymeric fluorocarbon filaments in an open weave along the length of the conductor, said filaments having a tensile strength of at least 40,000 psi and a dielectric constant of less than 2.8;

(b) covering the first layer circumferentially with a second layer of a polymeric film thereby providing a continuous skin enclosing the first layer; and

(c) covering the second layer circumferentially with a third layer consisting of a cross-linked polymeric lacquer thereby providing a continuous skin enclosing the second layer;

(d) covering the third layer circumferentially with an outer conductor; and

(e) covering the outer conductor circumferentially with an outer protective layer.

4,440,974

ELECTROMECHANICAL CABLE FOR WITHSTANDING HIGH TEMPERATURES AND PRESSURES, AND METHOD OF MANUFACTURE

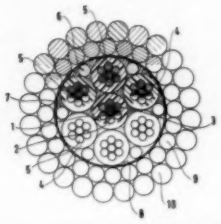
Jacques Naudet, Rueil Malmaison, France, assignor to Les Cables de Lyon, Rueil Malmaison, France

Filed Jun. 16, 1982, Ser. No. 388,818

Claims priority, application France, Jun. 18, 1981, 81 11992

Int. Cl.³ H01B 9/02

U.S. Cl. 174—108 5 Claims



1. An electromechanical cable capable of withstanding high pressures and temperatures of at least 200° C., the cable comprising a core having a plurality of insulated conductors covered with a conductive filler which fills the voids between the conductors, the core being surrounded by a layer of conductive textile material and by at least one layer of helically wound metal armor wire, the improvement wherein the filler is a composite material consisting essentially of a silicone polymer with a semiconductor charge of carbon black.

4,440,975

ELECTRICAL INSULATOR INCLUDING A MOLDED ONE-PIECE COVER HAVING PLATE-LIKE FINS WITH ARCUATELY DISPLACED MOLD LINE SEGMENTS

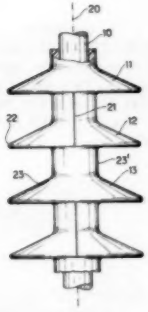
Alexandre Kaczerginski, Bellerive sur Allier, France, assignor to Ceraver, Paris, France

Filed Jul. 21, 1982, Ser. No. 400,292

Claims priority, application France, Aug. 5, 1981, 81 15203

Int. Cl.³ H01B 17/02

U.S. Cl. 174—209 4 Claims



1. An electrical insulator including an elongated insulating core having a longitudinal axis and a one-piece molded insulator cover disposed around the core, the cover having a plurality of axially spaced plate-like fins and a sleeve portion between each pair of adjacent fins, each fin having a circumferential edge which is symmetrical with respect to the axis of the core, and the surface of the cover having a mold line which extends from one end of the cover to the other end, wherein the improvement comprises:

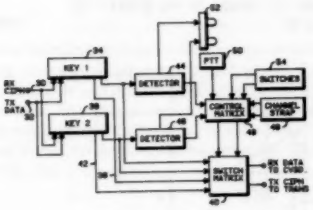
said mold line has at least two arcuately displaced segments between the edges of the end fins.

4,440,976

AUTOMATIC SELECTION OF DECRYPTION KEY FOR MULTIPLE-KEY ENCRYPTION SYSTEMS

Paul M. Bocci, Hoffman Estates; Terence E. Sumner, Roselle, and James R. Wojnarowski, Cary, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 17, 1981, Ser. No. 274,696
Int. Cl.³ H04K *1/00*
U.S. Cl. 179—1.5 R **9 Claims**



7. An apparatus for automatic selection of a proper key for decrypting a voice signal that has been subjected to delta modulation and encrypted according to one of first and second decryption keys, the apparatus comprising:

a. a first encode-decode module capable of decrypting according to a first key, the first encode-decode module receiving the encrypted data and decrypting according to the first key;

b. a first detector of delta modulation connected to the first encode-decode module to receive a signal from the first encode-decode module and test that signal for the presence of delta-modulation;

c. a second encode-decode module adapted to decrypt signals according to a second key different from the first key, the second encode-decode module receiving the encyrpted signal and simultaneously decoding it according to the second key while said first module decrypts the encrypted signal with the first key;

d. a second detector of delta-modulation connected to the second encode-decode module and receiving an output signal from the second encode-decode module to test it for the presence of delta-modulation;

e. a control matrix connected to the first and second detectors of delta-modulation and responsive to signals from the first and second detectors of delta-modulation to generate a control signal in response to a detected signal containing delta modulation; and

f. a switch matrix connected to the first and second encode-decode modules and to the control matrix to enable passage of an output signal from one of the first and second encode-decode modules that produces a signal containing delta-modulation.

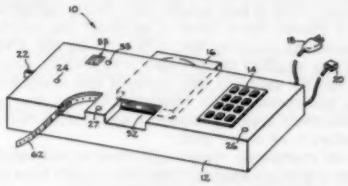
8. The apparatus of claim 7 comprising in addition a visual indicator connected to the first and second detectors of delta modulation and responsive to signals therefrom to indicate visually that one of the first and second encode-decode modules is producing a signal that contains delta modulation.

4,440,977

PUSHBUTTON DECODER AND PRINTER

John Pao, 527 Madera Dr., San Mateo, Calif. 94403, and Burton R. Tunzi, 2904 Scott Blvd., Santa Clara, Calif. 95050

Filed Jul. 25, 1979, Ser. No. 60,739
Int. Cl.³ H04M *11/06*
U.S. Cl. 179—2 DP **5 Claims**



1. Apparatus for printing characters along a tape in response to the transmission of audio tone dial signals comprising:

(a) an audio tone dial decoder for receiving audio tone dial signals and converting the audio tone dial signals into control signals; and

(b) a printer responsive to the control signals produced by said audio tone dial decoder for printing characters along a tape,

(c) said audio tone dial decoder comprising:

(a) a plurality of memory circuits for storing control signals for operating said printer;

(b) a dual tone multiple frequency analyzing circuit receiving said audio tone dial signals for converting said audio tone dial signals into code signals;

(c) a select function control logic circuit operatively responsive to said code signals for selecting one of said memory circuits; and

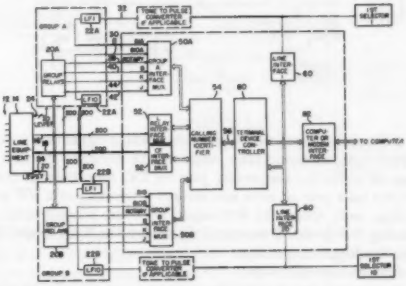
(d) a select letter control logic circuit operatively responsive to said code signals addressing said selected memory circuit to select therefrom the stored control signals, said selected signals constituting the control signals which operate said printer.

4,440,978

UNIVERSAL MEASURED SERVICE INTERFACE FOR STEP-BY-STEP TELEPHONE EXCHANGES

Mark L. Barnett, Bothell, and John C. Owens, Issaquah, both of Wash., assignors to Telematic Products, Inc., Redmond, Wash.

Filed Jul. 12, 1982, Ser. No. 397,464
Int. Cl.³ H04M *15/06*
U.S. Cl. 179—5.5 **9 Claims**



1. In a telephone central office exchange, a system having a plurality of linefinders, each connecting one of several incoming lines to an outgoing line of said linefinder, each of said linefinders having a B relay that is energized when said line-

finder is attempting to connect an incoming line to an outgoing line, a set of group relays associated with and controlling the operation of one linefinder at a time as it attempts to connect an incoming line to an outgoing line, said system further including line equipment having a line relay and a cut-off relay for each incoming line, each of said line relays being energized to produce a line signal when a station associated with said incoming line is "off hook" and the corresponding cut-off relay is not energized, each of said cut-off relays being energized to produce a control signal when a linefinder has connected the corresponding incoming line to its outgoing line, a system for identifying a calling number associated with an incoming line and a number called on said incoming line, comprising:

line multiplexer means connected to said line relays for selectively applying respective signals from individual line relays to an output port;

cut-off multiplexer means connected to said cut-off relays for selectively applying respective signals from individual cut-off relays to an output port;

group multiplexer means connected to said group relays for selectively applying respective signals from said B relays to an output port;

called number decoder means connected to the output line of each linefinder for determining the number called by signals on said output lines;

processing means connected to the output ports of said line multiplexer means, cut-off multiplexer means, group multiplexer means, and called number decoder means for identifying line relays and corresponding cut-off relays that have changed state in a preset pattern within a predetermined time that a B relay for an identifiable linefinder changes state in order to identify the incoming line connected to each linefinder outgoing line and to determine the number called on each linefinder output line, thereby identifying a calling station connected to each incoming line and a number called by said calling station.

4,440,979

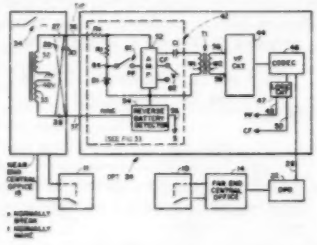
CURRENT SINK FOR DPT CHANNEL UNIT

Gregor D. McGibbon, San Carlos, and Kenneth K. Yu, Mountain View, both of Calif., assignors to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed May 3, 1982, Ser. No. 373,814

Int. Cl.³ H04M *7/06*

U.S. Cl. 179—16 EA **19 Claims**



1. Apparatus responsive to a first control signal that is one of a first state, a second state, and varying between the first and second states for selectively passing DC loop current from a source on a pair of lines and around a winding of a VF transformer only when the first signal is of the second state, and passing VF (voice frequency) signals on the lines to and from the winding, comprising:

first and second nodes;

first means for electrically connecting said nodes to associated lines;

second means for selectively AC coupling the winding across said nodes for coupling VF signals on the lines to and from the winding;

third means electrically connected across said nodes and including a first resistor having a larger resistance between a side thereof and a tap thereof for terminating the lines with the large resistance of said first resistor when the first signal is a first state;

current amplifier means electrically connected between said nodes and having an input terminal; and

first switch means electrically connected between said tap and said input terminal of said amplifier means and responsive to a second state of the first signal for causing said amplifier means to conduct for passing DC loop current on the lines and around the winding; a first state of said first signal disabling said amplifier means for preventing it passing DC loop current.

4,440,980

OVERVOLTAGE PROTECTION FOR A LINE CIRCUIT

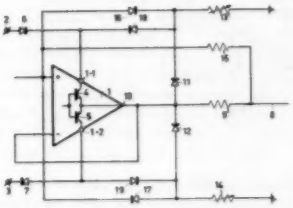
Pieter Bakker, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 6, 1981, Ser. No. 251,460

Claims priority, application Netherlands, Jan. 20, 1981, 8100242

Int. Cl.³ H04M *19/00;* **H02H** *3/22*

U.S. Cl. 179—81 R **7 Claims**



1. A control stage for a telephone subscriber's line for applying current in two directions to one wire of said subscribers's line comprising:

an amplifier having an input and an output;

said amplifier further having a first supply terminal (1-1) and a second supply terminal (1-2) for applying a supply current to said amplifier;

a first diode (6) connected between said first supply terminal (1-1) and a first voltage source (2) and a second diode (7) connected between said second supply terminal (1-2) and a second voltage source (3), the supply current being applied to and discharged from said amplifier via said diodes;

a third diode (11) connected between the output of said amplifier and said first supply terminal; and

a fourth diode (12) connected between the output of said amplifier and said second supply terminal.

4,440,981

ELECTRONIC HOLD CIRCUIT

Gary Grantland, Hartselle; Hugh S. Montgomery, Huntsville; Eduard F. B. Boeckmann, Huntsville, and Larry A. Woodworth, Huntsville, all of Ala., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Nov. 26, 1982, Ser. No. 444,759

Int. Cl.³ H04M *1/00*

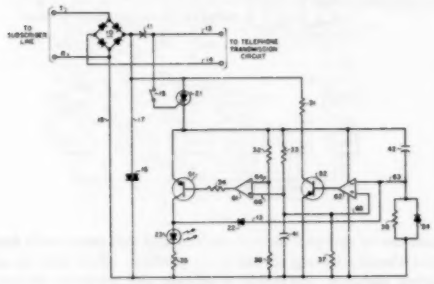
U.S. Cl. 179—81 R **11 Claims**

1. A hold circuit for use with a telephone instrument, said telephone instrument connected to the tip lead and ring lead of a subscriber telephone line and a source of line voltage, said hold circuit comprising:

first and second hold circuit leads, said first hold circuit lead connected to said ring lead and said second hold circuit lead connected to a first switching device, said first switching

device including a trigger lead connected to a hold switch, said hold switch arranged to be manually manipulated for turning on said first switching device and connecting said tip lead to said second hold circuit lead applying said line voltage to said first and second hold circuit leads;

sensing means connected across said first and second hold circuit leads, said sensing means providing an output signal



to a second switching device turning on said second switching device responsive to the application of said line voltage to said first and second hold circuit leads; and

subscriber line seizing means connected across said first and second hold circuit leads in response to said second switching device turning on, seizing said subscriber line into a hold condition.

4,440,982

HEARING AID

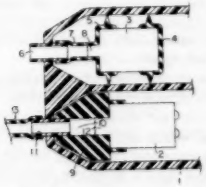
Johannes M. G. M. Kaanders; Cornelis H. M. van Rijsewijk, and Antoon F. Smerecnik, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,669

Claims priority, application Netherlands, Mar. 17, 1981, 8101286

Int. Cl.³ H04R *1/28, 25/00*

U.S. Cl. 179—107 R **6 Claims**



1. A hearing aid comprising, a housing having an outlet opening therein, a microphone supported within the housing, a receiver having a sound outlet for connection to a sound transmission duct, suspension means for supporting the receiver within said housing, said suspension means comprising a component including a body located within the housing and made of an elastic damping material and having a sound transmission duct within said body which communicates with the sound outlet in the receiver, said suspension means further comprising a rigid duct supported in said outlet opening of the housing and coupled to said body so that the rigid duct communicates with the sound duct within said body and also functions as the sole support for said component and said receiver such that the component is only in physical contact with the housing at the inner surface of said outlet opening and via said rigid duct located therein, said suspension means supporting the receiver mainly on the side of the receiver where the receiver sound outlet is located whereby sound vibrations produced in the walls of the receiver are substantially damped from reaching the housing.

4,440,983

ELECTRO-ACOUSTIC TRANSDUCER WITH ACTIVE DOME

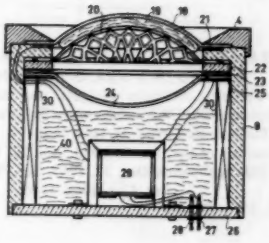
Hugues Facoetti; Philippe Menoret; Francois Micheron; Patrick Petit, and Pierre Ravinet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 5, 1981, Ser. No. 222,673

Claims priority, application France, Jan. 8, 1980, 80 00311

Int. Cl.³ H04R *15/00*

U.S. Cl. 179—110 A **9 Claims**



1. In an electro-acoustic transducer comprising a rigid case capped by a self-supporting active radiating membrane made from a polymer material having at least one dome shaped protuberance, said case being partially filled with an acoustically permeable resilient member having a bearing face conforming to the exact shape of the protuberance; the shape taken by the bearing face of said member being determined by the shape of said protuberance so that said resilient member is deformed by deformation of said protuberance in response to an applied force and restores said protuberance to its initial shape upon removal of said force.

4,440,984

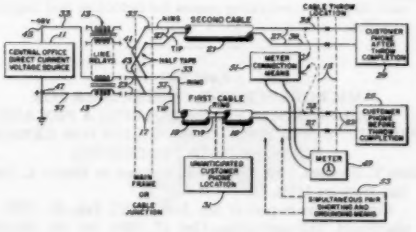
METHOD OF TESTING TELEPHONE CABLE PAIRS

James M. Buzbee, 1602 NW. 5th Ave., Mineral Wells, Tex. 76067

Filed May 6, 1982, Ser. No. 375,544

Int. Cl.³ H04B *3/46*

U.S. Cl. 179—175.3 A **11 Claims**



1. An improved method of testing telephone cable; wherein first and second telephone cables each comprising a plurality of pairs extend from a location where half taps have been applied and over approximately equal distances to a cable throw or test location; wherein it is desired to determine for each pair to be tested whether or not a customer phone is present, and if present, its location relative to the cable throw or test location, all without disconnecting a customer phone, making a bridging connection through a test set, or disconnect-

ing the central office direct current voltage source; which improved method comprises:

a. connecting a meter between conductors of like polarity of the pair being tested of the first cable and the corresponding half tap pair of the second cable and; observing the presence or absence of current flow, and if current is present, observing the direction of the current flow through the meter, thereby determining whether or not a customer phone is present and if so, whether it is connected to the first cable or to the second cable; and if a throw is completed again observing the direction of current flow through the meter, thereby determining whether or not the customer phone has been transferred and is therefore on the field side of the throw location as it should be.

4,440,985

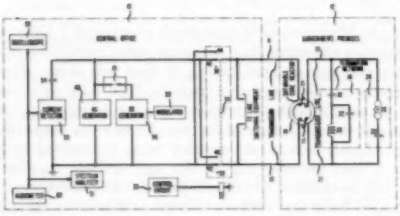
APPARATUS FOR DETERMINING THE LOCATION OF FAULTS IN A TRANSMISSION LINE

Joseph Federico, Berkeley Heights, and Sigurd G. Waaben, Princeton, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 275,903, Jun. 22, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 452,942

Int. Cl.³ H04B *3/46*

U.S. Cl. 179—175.3 F **14 Claims**



14. Circuitry for locating faults in a transmission line as being located on one side or the other of a nonlinear network arranged in cascade with said line, said network

characterized by

means for generating spikes in response to a first signal applied to said line from a test source and for superimposing said spikes on said first signal, and

means for displacing said spikes in response to a second signal applied to said transmission line with said first signal,

said circuitry comprising means for detecting said displaced spikes.

4,440,986

MICROPROCESSOR CONTROLLER FOR SIMULTANEOUSLY CONTROLLING A PBX AND PROVIDING MULTIPLE USER ACCESS FOR GENERAL PURPOSE DATA PROCESSING

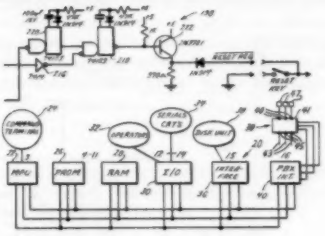
John T. Thorson, Oak Forest, Ill., assignor to Walter L. Douglas, Hickory Hills, Ill.

Continuation-in-part of Ser. No. 13,617, Feb. 21, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 200,965

Int. Cl.³ H04M *11/00;* **H04Q** *3/54*

U.S. Cl. 179—2 DP **25 Claims**

1. A stored program controlled microprocessor controller includes a microprocessor with means to operate said microprocessor in a time sharing mode to simultaneously service a centrally program controlled PBX and a data processing system, said controller having a first memory dedicated to storing the program for controlling PBX operation, said PBX including a plurality of trunk ports, each of which has means to connect to an incoming trunk, and a plurality of line ports, each of which has means to connect to a telephone extension; thedata processing system having a plurality of data ports for accessing the microprocessor to input, process and output data and programming information unrelated to the operation of said PBX, said controller having an additional memory means, means to partition said additional memory means and assign at



least one of said partitions to each of said data ports, each data port thereby having access to no partition other than its assigned partition, and means to allocate and prioritize the processing time of said microprocessor between said PBX and said data processing system.

4,440,987

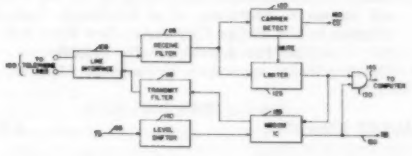
COMPUTER AND PERIPHERAL INTERFACE CIRCUIT

Jerry J. Heep, Arlington, and Paul Schreiber, Fort Worth, both of Tex., assignors to Tady Corporation, Fort Worth, Tex.

Filed Dec. 29, 1981, Ser. No. 335,554

Int. Cl.³ H04L *27/14*

U.S. Cl. 179—2 DP **5 Claims**



2. Apparatus for converting frequency-shift-keyed signals into tone burst-coded signals comprising,

means responsive to said frequency-shift-keyed signals for converting said signals into squarewaves,

means responsive to said squarewaves for generating a first electrical signal when said squarewaves have a first frequency and for generating a second electrical signal when said squarewaves have a second frequency, and

means responsive to said squarewaves and to said first signal for producing a tone burst at the frequency of said squarewave and responsive to said squarewave and to said second signal for producing no signal.

4,440,988

MODEM WITH LOW PART COUNT AND IMPROVED DEMODULATOR

Dale A. Heatherington, Decatur, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

Division of Ser. No. 273,398, Jun. 15, 1981. This application Dec. 13, 1982, Ser. No. 448,980

Int. Cl.³ H04M *11/00*

U.S. Cl. 179—2 C **3 Claims**

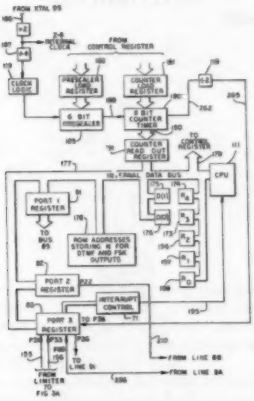
1. In a data communications adapter for connecting a data port to a telephone line and for providing angle modulated signals to said telephone line in response to data signals provided to said data port, the improvement comprising in combination:

a first register means for storing data signals received from said data port;

a second register means for providing a frequency signal;

signal generating means connected to said second register for providing an output signal of a frequency proportional to said frequency signal;

control means responsive to a first predetermined string of said data signals at said data port to provide a first mode of operation for said data communications adapter and alternately for providing a second mode of operation for said data communications adapter;



said control means being responsive to said data signals stored in said first register means to cause said second register means to provide one of a predetermined set of said frequency output signals corresponding to one of a predetermined group of predetermined high tones for dual tone dialing when said data communications adapter is in said first mode of operation and alterately responsive to said data signals stored in said first register means for providing one of a predetermined pair of said frequency signals corresponding to one of a predetermined pair of said angle modulated signals; and

coupling means for coupling said output signal from said signal generating means to said telephone line.

4,440,989

KEY TELEPHONE AREA VOICE PAGING CIRCUIT AND METHOD

William D. Gibb, Belleville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 22, 1982, Ser. No. 360,184

Int. Cl.³ H04M *1/72, 1/60*

U.S. Cl. 179—99 P **6 Claims**

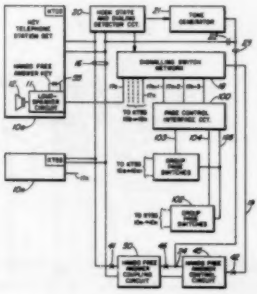
1. An area voice paging circuit for use in a key telephone system wherein a signalling switch network, having signalling ports, provides for connection of a.c. voice band signals and d.c. control signals to loudspeaker circuits each being selectable via a respective one of the signalling ports, and each residing in an associated key telephone station set, the area voice paging circuit comprising:

a page control interface circuit for generating a page signal in response to receipt of the d.c. control signals via the signalling switch network, and for generating a d.c. biased voltage signal which includes an a.c. voltage signal corresponding to the a.c. voice band signals, the a.c. voltage signal being superimposed on a predetermined d.c. voltage;

a plurality of page switches each having an output terminal connected in common with one of a plurality of the signalling ports, the page switches being responsive to an assertion of the page signal from the page control interface circuit for coupling the d.c. biased voltage signal from the page control interface circuit to the respective signalling ports for use in the associated loudspeaker circuits; and

wherein the page control interface circuit comprises:

a plurality of page buffer circuits each having a signal input for receiving the d.c. control signal from one of the signalling ports, a page signal output, a unidirectional current path connected to the signal input, and a comparator with inputs, one input being connected to receive a reference voltage and another input being connected in series with a resistance to the signal input, the comparator being responsive to the d.c. control signal exceeding the reference voltage for generating the page signal at the page signal output;



an amplifier system including a resistive input connected to the unidirectional current path in each of the plurality of page buffer circuits, a power amplifier for amplifying the a.c. voice band signals appearing across the resistive input to generate the d.c. biased voltage signal at an output of the power amplifier, in response to an amplifier control signal, and a threshold detector for generating the amplifier control signal in response to more than a predetermined d.c. voltage appearing across the resistive input.

4,440,990

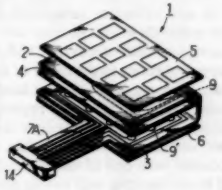
MEMBRANE KEYBOARD ASSEMBLY

Satoru Nozaki, Northridge, Calif., assignor to SMK Electronics Corporation, USA, Carson, Calif.

Filed May 19, 1982, Ser. No. 379,709

Int. Cl.³ H01H *9/00*

U.S. Cl. 200—5 A **8 Claims**



1. A membrane keyboard assembly for use in a membrane keyboard switch device, comprising:

a flexible base;

plural contact areas formed on said flexible base;

plural connection lines formed on said flexible base and each connected to a respective one of said contact areas, said connection lines containing spaced gaps;

resistive layers applied to selected of said contact areas and said connection lines and the spaced gaps, whereby the

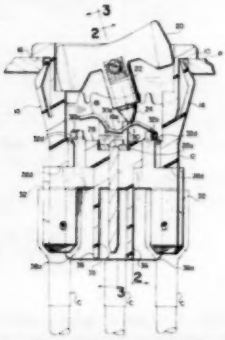
portions of said resistive layers applied to said spaced gaps shunt said selected of said connection lines and said contact areas to form suppression resistances.

4,440,991

ELECTRIC SWITCH WITH NESTED TERMINALS

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Filed Oct. 7, 1981, Ser. No. 309,458
Int. Cl.³ H01H *21/00*
U.S. Cl. 200—6 R **4 Claims**



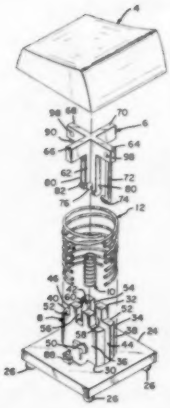
1. An electric switch comprising a molded case of dielectric material and including a generally rectangular body portion, means for said case to be front mounted in a panel opening, said body portion defining an upwardly open cavity, at least one movable contact in said cavity, an operating member movably mounted in said case for selectively moving said movable contact, said body portion further including a bottom wall having slots defined therein, terminals in said switch case bottom wall, said terminals having lower blade portions for slidably receiving wire connectors, said blade portions projecting downwardly but arranged generally within the periphery of said rectangular body portion, upper portions of some of said terminals defining contacts which are selectively engageable by said movable contact, each of said some terminals having an intermediate portion in the plane of said blade portion and defining an offset between said upper contact defining portion and said lower blade portion such that said upper contact portion is located inside said switch cavity and said lower blade portion has at least one vertically extending edge located adjacent to an outside corner of said rectangular body portion said switch case body having an integrally formed divider wall in said cavity to define side-by-side subcavities, certain of said terminals in said bottom wall slots having upper portions in certain of said subcavities and other of said terminals having upper portions in the other of said subcavities, said some terminals having edges of their blade portions located adjacent at least two corners of said rectangular body portion said some terminals located with edges thereof adjacent said corners of said switch case body portion, at least one center terminal associated with one of said subcavities and located in a slot defined in said bottom wall so that one vertically extending edge of the blade portion of said center terminal is arranged adjacent to and in the plane of the long side of said rectangular body portion, said center terminal having its generally planar blade oriented perpendicular to said long side of said rectangular body portion each of said terminals comprising a flat strip of conductive material having a thickness which is constant throughout its length, said upper portion of each terminal having a width which is less than that of said intermediate portion to define an abutment edge on said terminal, said slots in said bottom wall being stepped so that each said slot has a downwardly facing abutment surface for engagement by said terminal abutment edge to locate said terminal in said switch case body portion.

4,440,992

LOW PROFILE KEYBOARD SWITCH ACTUATING ASSEMBLY

Mark R. Desmarais, Derry, N.H., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 354,319, Mar. 3, 1982, abandoned. This application Jun. 28, 1983, Ser. No. 508,647
Int. Cl.³ H01H *3/12*
U.S. Cl. 200—340 **4 Claims**



1. A low profile switch actuating assembly comprising a frame having a fixed end and a free end, an axial opening extending into the free end towards the fixed end, a plunger in the opening, the plunger having a lower end which is proximate to the fixed end of the frame and a force-receiving end which is proximate to the free end of the frame, the plunger being slidably movable into the frame from a normal position to a depressed position, the force-receiving end of the plunger being located beyond the free end of the frame when the plunger is in the normal position and being movable towards the free end when the plunger is moved to the depressed position, the force-receiving end of the plunger having a key top thereon which is pressed to move the plunger to the depressed position, the switch actuating assembly being characterized in that:

the free end of the frame has a plurality of angularly spaced slots extending therethrough from the axial opening,

the force-receiving end of the plunger has a plurality of radially extending arms extending therefrom, the arms being in alignment with the slots in the frame, the arms having adjacent portions, which are adjacent to the axis of the plunger and which are dimensioned to be freely received in the slots, the arms having outer end portions which are remote from the axis of the plunger,

the key top has an underside which is opposed to the free end of the frame, a frame-receiving recess is provided in the underside which is dimensioned to receive the free end of the frame, a plurality of arm-receiving recesses extend radially from the frame-receiving recess,

the force-receiving end of the plunger and the adjacent portions of the arms being in the frame-receiving recess, the outer end portions of the arms being received in, and secured in, the arm-receiving recesses whereby,

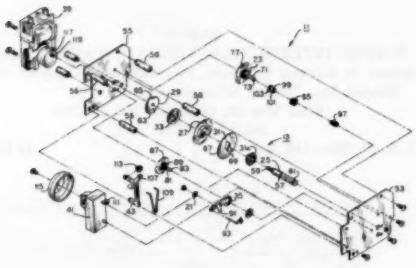
upon movement of the plunger from the normal position to the depressed position, the free end of the frame enters the frame-receiving recess and the adjacent portions of the plunger arms enter the arm-receiving slots.

4,440,993

TIMER DEVICE AND METHOD OF OPERATING

Richard A. Wandler, Clinton, Iowa, and Kenneth R. Renkes, Fenton, Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Aug. 17, 1982, Ser. No. 408,797
Int. Cl.³ H01H 7/08
U.S. Cl. 200—38 R 20 Claims



19. A timer device adapted for timing through an operating time period selected therefor by an operator comprising:

means adapted to be rotatably driven for indicating the remaining operating time in the selected operating time period for the timer device;

a continuous gear associated with said indicating means;

a pair of means interconnected in meshing engagement with said continuous gear and operable generally for rotatably driving said indicating means in different preselected speed modes through an operating time period in excess of a predetermined operating time period and through the predetermined operating time period with the sum of the excess and predetermined operating time periods comprising the selected operating time period for the timer device;

means for actuating one of said driving means in its meshing engagement with said continuous gear to rotatably drive said indicating means in one of the different preselected speed modes;

means associated with said indicating means and operable generally at the end of the excess operating time period for disabling a part of said one driving means in the meshing engagement with said continuous gear and disassociating said part of said one driving means from another part of said one driving means while continuing to operate the drive of said another part of said one driving means by said actuating means; and

means operable generally for interconnecting the other of said driving means and said another part of said one driving means with said other driving means being in the meshing engagement thereof with said continuous gear so as to rotatably drive said indicating means in another of the different preselected speed modes to initiate the predetermined operating time period upon the disabling of said first named part of said one driving means.

4,440,994

PIVOTED ACTUATOR OFF LOCK SWITCH WITH OPERATOR KEY NONREMOVABLE IN ON POSITION

Gursharan P. S. Nat, Smithfield, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 20, 1982, Ser. No. 410,103
Int. Cl.³ H01H 27/00
U.S. Cl. 200—42 T 5 Claims

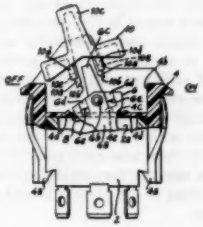
1. An electric switch comprising, in combination: an insulating housing having an opening thereon;

switch contacts in said housing;

a pivotally supported actuator within said opening movable between ON and OFF positions for actuating said switch contacts between ON and OFF conditions, respectively;

locking means carried by said actuator and biased for engagement with said housing for preventing movement of said actuator from said OFF position to said ON position;

a manual operator removably coupled to said actuator for releasing said locking means, said operator having resilient coupling means extending along the exterior of said actuator and cammed outwardly by said actuator during coupling movement of said operator to said actuator, said



coupling means moving inwardly into engagement with cooperating means on said actuator upon completion of said coupling movement for releasably retaining said operator coupled to said actuator; and

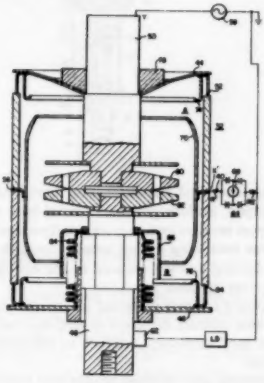
means on said housing in juxtaposition with said coupling means when said actuator is moved to said ON position, said means on said housing comprises a constriction in said opening and movement of said actuator to said ON position carries at least one of said coupling means into juxtaposition with said constriction for preventing outward movement of said coupling means.

4,440,995

VACUUM CIRCUIT INTERRUPTER WITH ON-LINE VACUUM MONITORING APPARATUS

William J. Lange, Murrysville, and Robert B. Gosser, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 19, 1981, Ser. No. 226,331
Int. Cl.³ H01H 33/66
U.S. Cl. 200—144 B 20 Claims



1. A vacuum circuit interrupter, comprising:

(a) enclosure means defining a substantially evacuated volume;

(b) relatively movable contact means electrically intercon-

nectable with an external voltage source means and disposed to interrupt electrical current within said evacuated volume;

(c) first and second spaced electrically conductive shield means disposed within said enclosure means for protecting internal portions of said enclosure means, said first and second shield means having therebetween a subvolume, said first of said shield means being electrically interconnectable with said external voltage source means for having a voltage potential existent thereon, said second of said shield means communicating electrically with a region external of said enclosure means; and

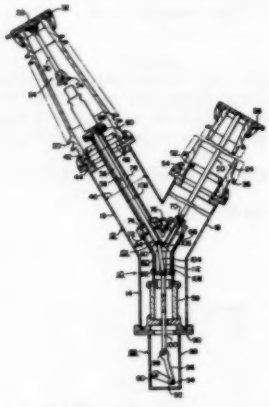
(d) current measurement means disposed outside of said enclosure means in circuit relationship with said second shield means and connectable with said voltage source means at another electrical potential so that an electric field of sufficient magnitude is present in said subvolume to cause electrons which are present in said subvolume to to interact with gas molecules in said subvolume to form gas ions which in turn interact with one of said shield means to thus cause electrical current to flow through said current measurement means to thus give an indication of the amount of gas present in said substantially evacuated volume.

4,440,996

DEAD TANK GAS-INSULATED PUFFER-TYPE CIRCUIT INTERRUPTER HAVING INTERRUPTING UNIT IN INSULATED CASING

Ben J. Calvino, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1981, Ser. No. 331,941
Int. Cl.[3] H01N *33/88*
U.S. Cl. 200—148 A 9 Claims



1. A gas-insulated circuit breaker comprising:

a Y-shaped, hollow grounded metal base member having a support section and two angularly-extending legs;

a hollow insulating casing secured to each base member leg and having a cover secured to the end thereof distal from said base member leg;

a stationary contact disposed in one of said casings;

a movable contact disposed in said one casing and separable from said stationary contact to establish an arc therebetween;

an insulating gas disposed within said base member and said casings;

means disposed within said one casing for directing a blast of insulating gas into the arc established between said separating contacts comprising a piston fixedly disposed in said one casing and a puffer cylinder secured to said movable contact and movable over said piston to compress the gas therebetween;

an operating mechanism associated with said base member support section for moving said movable contact; and

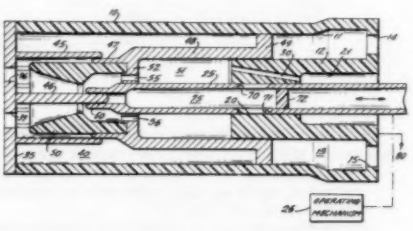
drive rod means insulatably connecting said movable contact and said operating mechanism, said operating mechanism moving said movable contact through said drive rod means.

4,440,997

PUFFER INTERRUPTER WITH ARC ENERGY ASSIST

Ruben D. Garzon, Malvern, Pa., assignor to Brown Boveri Electric Inc., Rolling Meadows, Ill.

Filed May 28, 1982, Ser. No. 382,920
Int. Cl.[3] H01H *33/88*
U.S. Cl. 200—148 A 14 Claims



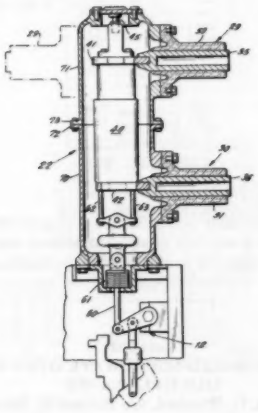
1. A puffer interrupter which employs arc energy assist for its opening operation; said puffer interrupter comprising an elongated housing having a stationary contact means fixed therein and a stationary piston fixed therein; said stationary piston telescopically receiving a movable cylinder; said movable cylinder having a movable contact means fixed thereto and having an insulation nozzle fixed thereto; said movable contact means being movable with said cylinder and said nozzle between an engaged and disengaged position with respect to said stationary contact means; said insulation nozzle defining an axial gas flow path which surrounds the arcing space between said movable and stationary contact means when said movable contact means separates from said stationary contact means; said movable cylinder and said piston defining a compressible volume which is connected to the interior of said nozzle and which is compressed when said movable contact means moves to said disengaged position; said cylinder having an enlarged outer flange which moves within and is slidably sealed to the interior of said elongated housing for at least a portion of the motion of said cylinder within said housing; the volume surrounding said insulation nozzle communicating with one surface of said flange so that an increase in pressure within said last mentioned volume produces a differential force which tends to move said movable contact means towards said disengaged position; said movable contact means comprising a tubular main contact and a concentric tubular movable arcing contact disposed coaxially and interiorly of said tubular main contact; said stationary contact means comprising a tubular main stationary contact which telescopically receives said tubular main contact in said engaged position, and a central stationary arcing contact rod which telescopically engages said tubular movable arcing contact when said movable contact means is in its said engaged position; said movable and stationary arcing contact means having a deeper telescopic region of engagement than said tubular movable and stationary main contacts whereby said movable and stationary arcing contacts are the last to disengage when said cylinder is moved to said disengaged position; said nozzle being disposed in the annular space between said tubular main contact and said tubular movable arcing contact.

4,440,998

SEGMENTED CIRCUIT BREAKER HOUSING WITH ROTATABLY ADJUSTABLE BUSHING POSITIONS

Lorne D. McConnell, and Edward M. Spencer, both of Chalfont, Pa., assignors to Brown Boveri Electric Inc., Rolling Meadows, Ill.

Filed Jul. 9, 1982, Ser. No. 396,776
Int. Cl.³ H01H *33/70*
U.S. Cl. 200—148 R **10 Claims**



1. A circuit breaker housing containing interrupter structure means in which the major parts thereof can be arranged to provide at least two different spacings between free ends of its bushings, whereby said circuit breaker housing can be used in either an indoor or an outdoor application; said circuit breaker housing comprising an elongated cylinder which includes first and second cylinder halves which are coaxial with one another and which both have a respective symmetric flange at one of their respective ends; said flanges having means so that they can be moved relative to each other and being connectable in sealed abutting engagement with one another and being fixed to one another in one of at least two predetermined relative angular relationships; said circuit breaker housing being operable in an installation when said flanges are in either of said at least two angular relationships; each of said first and second cylinder halves having respective cylindrical bushings extending therefrom which have axes which are perpendicular to the axis of said first and second cylinder halves, respectively; each of said bushings of said first and second cylinder halves having a respective free terminal end; said interrupter structure means disposed within the interior of said first and second cylinder halves; said interrupter structure means having first and second terminals connected to said bushings of said first and second cylinder halves, respectively; said free ends of said bushings having a first spacing when the first and second flanges are fixed together in a first of said predetermined angular relationships and having a second spacing when said first and second flanges are fixed together in a second of said predetermined angular relationships.

4,440,999

MEMBRANE SWITCH

John I. Doughty, White Bear Lake, Minn., assignor to Press On, Inc., Stillwater, Minn.

Filed Aug. 13, 1982, Ser. No. 407,821
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—5 A **7 Claims**

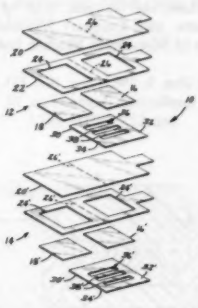
1. A membrane switch, comprising:

(a) a spacer lamina having oppositely facing surfaces and defining a window therein;

(b) a first transparent, resilient electrical circuit contact adjacent a first of said surfaces and interposed in said window;

(c) a second transparent electrical circuit contact adjacent a second of said surfaces and interposed in said window;

(d) contact support mounting said contacts, wherein each contact is inlain within a segment of said support, having



a surface for engaging the opposite of said contacts flush with a surface of said support in which it is inlain; and

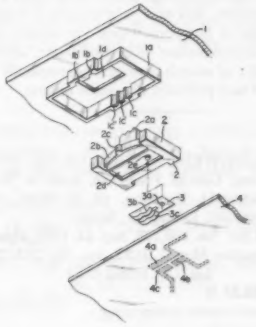
(e) conductive ink printed around said contacts and also printed on said support, forming borders around said contacts, wherein a signal may be conducted to said contacts.

4,441,000

SLIDE SWITCH MECHANISM

Kaname Suwa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 352,021
Claims priority, application Japan, Mar. 6, 1981, 56-32113
Int. Cl.³ H01H *9/00, 15/00*
U.S. Cl. 200—291 **6 Claims**



1. A slide switch mechanism comprising:

a guide member;

a slide member for switching electrical contacts, said slide member being reversibly mountable in said guide member for slidable movement therein;

first engaging means provided in different patterns on two mutually opposed faces of said guide member; and

second engaging means provided on a face of said slide member in sliding contact with said guide member to elastically engage with said first engaging means, wherein when said slide member is fitted in said guide member in one manner, said slide member stops at a position different

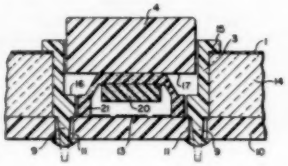
from the stopping position of the slide member when fitted in said guide member in the reverse manner.

4,441,001

KEYBOARD FOR INPUTTING PLURAL LETTERS OR SYMBOLS

Ryuzo Miyano; Haruyuki Uenishi, both of Ikoma; Hisashi Akatani, Hirakata, and Takenori Akamine, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 9, 1981, Ser. No. 271,926
Claims priority, application Japan, Jun. 10, 1980, 55-78600
Int. Cl.³ H01H *3/12*
U.S. Cl. 200—308 **6 Claims**



1. A keyboard comprising:

a printed circuit substrate having top and bottom surfaces and having a latticework configuration forming a plurality of apertures and also having a plurality of electrodes arranged on frames of said latticework; a transparent panel placed on said top surface of said printed circuit substrate and having through apertures arranged at positions opposite to said plurality of electrodes;

a plurality of switch members which are fitted into said through apertures in said transparent panel;

a display member arranged on said bottom surface of said printed circuit substrate, said display, member having a plurality of indicia contained thereon;

said keyboard being arranged such that said printed circuit substrate, said transparent panel and said plurality of switch members are integral with each other and with said display member, and said indicia of said display member are disposed at positions which are visible through said apertures of said printed circuit substrate, wherein each of said plurality of switch members corresponds to a respective one of said plurality of visible indicia.

4,441,002

COOK-BY-WEIGHT MICROWAVE OVEN

Wesley W. Teich; George Freedman, both of Wayland, and Joseph R. Adamski, Brighton, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 190,135, Sep. 24, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,721
Int. Cl.³ H05B *6/68*
U.S. Cl. 219—10.55 B **6 Claims**

1. A microwave oven comprising;

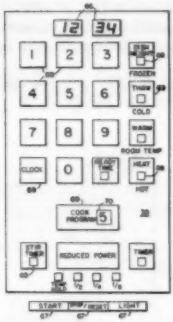
a conductive cavity;

a magnetron for supplying microwave energy to said cavity;

a weight sensitive device coupled to said cavity for providing a signal corresponding to the initial weight of food positioned within said cavity;

an operator actuable control for selecting frozen, refrigerator temperature, or room temperature as being indicative of the approximate initial temperature of said food;

a microprocessor for calculating a first time period for thawing said food, a second time period for raising the temperature of said food from refrigerator temperature to room temperature, and a third time period for raising the temperature of said food from room temperature to a hot temperature, said first, second, and third time periods being calculated as a function of said initial weight signal; and



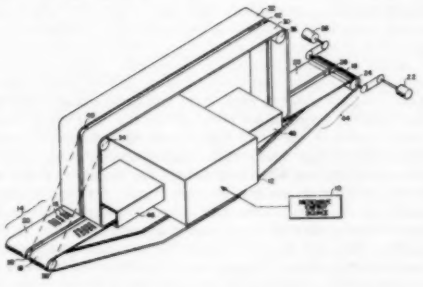
said microprocessor controlling said magnetron in accordance with a selection of said first, second, and third time periods in response to said operator actuable control.

4,441,003

CONVEYORIZED MICROWAVE OVEN WITH MULTIPLE LANES

E. Eugene Eves, II, Westford, and Richard H. Edgar, Chelmsford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 16, 1982, Ser. No. 369,198
Int. Cl.³ H05B *9/06*
U.S. Cl. 219—10.55 A **1 Claim**



1. The method of cooking product in a conveyorized microwave oven, comprising the steps of:

providing a conductive cavity having first and second apertures on opposing walls for providing continuous access to the interior thereof wherein leakage of microwave energy is prevented by a first microwave suppression tunnel coupled with said first aperture and a second microwave suppression tunnel coupled with said second aperture;

energizing said cavity with microwave energy;

moving a first conveyor belt through said first aperture, said cavity and said second aperture for transporting product to be heated by said microwave energy;

moving a second conveyor belt through said first aperture, said cavity and said second aperture for transporting product to be heated by said microwave energy; and

controlling the speed of said first conveyor belt in accordance with the load of said product on said first conveyor belt, the load of said product on said second conveyor belt, and the effective dummy load of said oven.

4,441,004

MULTIPLE PIPE ELEMENT ELECTRODE ASSEMBLY EDM METHOD AND APPARATUS

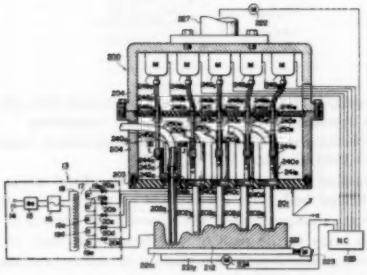
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jun. 9, 1981, Ser. No. 271,982

Claims priority, application Japan, Jun. 12, 1980, 55-78383; Jun. 25, 1980, 55-85185; Jun. 26, 1980, 55-86909; Jun. 26, 1980, 55-86910

Int. Cl.³ B23P 1/08

U.S. Cl. 219—69 E 30 Claims



1. An EDM method of machining a contoured cavity in a conductive workpiece, comprising:

(a) forming a multiple pipe assembled EDM electrode by

(a1) arranging a multiplicity of conductive open-ended pipe elements two-dimensionally in parallel with one another and spaced apart from one another with a predetermined uniform minimum spacing to establish a mutually electrically insulating relationship in such a manner that an imaginary envelope surface which is substantially defined collectively by the frontal open-end portions of said conductive pipe elements has a preselected three-dimensional contour complementary with a contour of a said cavity to be machined in the workpiece and (a2) securely holding together said multiplicity of pipe elements so arranged in sub-step (a1);

(b) juxtaposing said multiple pipe assembled EDM electrode with the workpiece to define an EDM gap between the annular machining surface provided on each of said frontal open-end portions and said workpiece;

(c) flushing said multiple EDM gap with a dielectric liquid by establishing a forced flow of said dielectric liquid through said pipe elements;

(d) effecting a succession of electrical discharges through said flushed dielectric liquid across each of said multiple EDM gaps between said annular machining surfaces and the localized areas of the workpiece respective juxtaposed therewith by passing a succession of electrical pulses individually between each of said multiple pipe elements and said workpiece to cause EDM material removal from said localized areas; and

(e) advancing said assembled electrode unitarily and relatively into said workpiece in a machining feed direction parallel with said pipe elements to a predetermined depth while relatively displacing said EDM electrode and said workpiece in a plane essentially orthogonal to said machining feed direction by a distance in excess of said predetermined uniform spacing along each of two mutually orthogonal axes on said plane.

4,441,005

EDM PULSE GENERATOR WITH A VARIABLE OUTPUT INDUCTOR FOR PRODUCING PULSE WITH GRADUALLY RISING EDGES

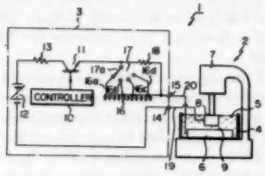
Toshihiko Furukawa, Yamato, Japan, assignor to Sodick Co., Ltd., Yokohama, Japan

Filed Apr. 23, 1981, Ser. No. 256,765

Claims priority, application Japan, May 6, 1980, 55-58742; Aug. 20, 1980, 55-113393

Int. Cl.³ B23P 1/08

U.S. Cl. 219—69 C 3 Claims



1. A working pulse generator for an electrical discharge machining apparatus capable of mirror finishing which provides working pulses to a gap formed between a workpiece and an electrode, said working pulse generator comprising

means for repetitively generating pulses having a narrow pulse width of not greater than 10 μsec. comprising a direct current power source, switching means connected in series with the direct current power source, and controller means for controlling the switching means to repetitively open and close to produce said narrow width pulses at an output, the switching means being a switching transistor and the controller controlling the conducting condition of the switching transistor,

an output circuit comprising the parallel combination of a resistor and connected to the output of said pulse generating means for producing a gradual rise in rising portions of said pulses, and

means for providing said pulses having gradual rising portions from said output circuit to the machining gap, the providing means applying the pulses across the gap between the electrode and the workpiece in such a way that the potential of said workpiece is higher than that of the electrode.

4,441,006

PROCESS OF JOINING A CONTACT

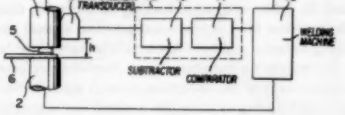
Kazumichi Machida, and Yoshie Inada, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00013, § 371 Date Jul. 19, 1982, § 102(e) Date Jul. 19, 1982, PCT Pub. No. WO82/02621, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 14, 1982, Ser. No. 403,628

Int. Cl.³ B23K 1/00

U.S. Cl. 219—85 CM 4 Claims



1. A process for joining a contact for electric equipment to a base, said process comprising the steps of:

(a) placing between the contact and the base a layer of a bonding medium which melts to form a bond at a tempera-

ture lower than the temperature at which the contact and the base melt;

(b) placing the contact and the base between upper and lower electrodes;

(c) pressing the upper and lower electrodes towards each other with a constant pressure;

(d) supplying an electric current to the upper and lower electrodes at a predetermined constant voltage;

(e) detecting changes in the spacing between the upper and lower electrodes due first to the increase in thickness of the contact, the layer of a bonding medium, and the base caused by electrical heating and then to the decrease in thickness of the layer of a bonding medium when it melts and part of it flows out from between the base and the contact; and

(f) turning off the electric current at a predetermined interval of time after the spacing between the upper and lower electrodes has begun to decrease, the predetermined interval of time being calculated to correspond to the interval during which an optimum amount of the layer of a bonding medium has melted and flowed out from between the contact and the base to form a fillet.

4,441,007

ELECTRICAL STUD-WELDING APPARATUS

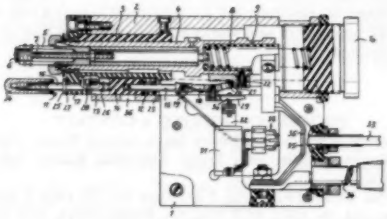
Ernst G. Jordan, Menden, Fed. Rep. of Germany, assignor to Firma OBO Bettermann OHG, Fed. Rep. of Germany

Filed Oct. 30, 1981, Ser. No. 316,974

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103543

Int. Cl.³ B23K *9/20*

U.S. Cl. 219—98 **14 Claims**



1. An electrical stud-welding apparatus comprising a housing member, a welding piston supported for limited axial displacement in the housing, the apparatus having on one end a studholder protruding beyond the forward end of the housing and a force accumulator in the form of a spring element pressing against its other end, an actuating member for displacing the welding piston into its rearward position against the force of the spring element and held fast until the start of the welding process, the actuating member being disposed for resting on the workpiece-side of the apparatus in such manner that when the apparatus housing is brought toward the workpiece the welding piston is positively brought into the ready-for-welding position, said actuating member being constructed as a rod supported for limited displacement along an axis parallel to the welding piston, said rod, in its forward position, protruding beyond the stud holder with its inserted stud.

4,441,008

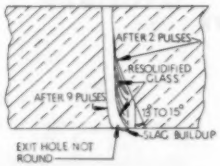
METHOD OF DRILLING ULTRAFINE CHANNELS THROUGH GLASS

Uck I. Chan, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 14, 1981, Ser. No. 301,796

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LL **11 Claims**



1. A method for generating an ultrafine channel through and between opposed surfaces of a glass body, comprising:

(a) preheating said glass body to the temperature range of 500°–1040° F. (260°–560° C.); and

(b) directing a beam of laser energy along a fixed axis at said preheated body and against one of said surfaces for a period sufficient to melt and vaporize the portion of said glass body in the path of said beam, said laser energy having a wave length of at least about 10.6 microns and an energy level of 200–500 watts, said beam being focused at a point away from said one surface at a distance spaced from said one surface in the range of 0.02–0.08 inches.

4,441,009

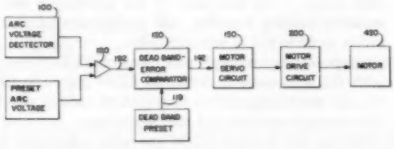
ARC VOLTAGE CONTROL CIRCUIT FOR WELDING APPARATUS

William J. Toohey, San Diego, Calif., assignor to Larry Russell, El Toro, Calif.

Filed Apr. 26, 1982, Ser. No. 372,194

Int. Cl.³ B23K *9/10*

U.S. Cl. 219—124.03 **7 Claims**



1. An improved arc voltage control circuit for controlling an electrically positionable welding electrode relative to a workpiece, comprising:

arc voltage detection means for providing a first signal indicative of the arc voltage;

reference means for providing a second signal indicative of a reference arc voltage level;

comparator means for providing an error signal indicative of the difference between the reference voltage level and the arc voltage;

electrode positioning means responsive to control signals;

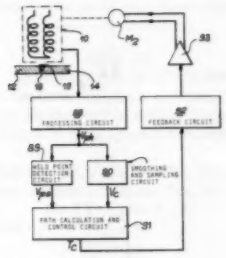
servo circuit means responsive to said error signal for providing said control signal to said positioning means so as to cause said positioning means to position said electrode to diminish said error signal, said positioning occurring with an acceleration characteristic which is independent of the magnitude of the error signal.

4,441,010

PROCESS AND APPARATUS FOR THE LATERAL POSITIONING OF A MEMBER RELATIVE TO A JOINT

Jean Cornu, Nantes; Jean-Marie Detriche, Saint Germain en Laye; Pierre Gil, Bures sur Yvette; Paul Marchal, Gif-sur-Yvette, and Jean Vertut, Issy les Moulineaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 23, 1982, Ser. No. 371,268
Claims priority, application France, Apr. 30, 1981, 81 08671
Int. Cl.³ B23K 9/12
U.S. Cl. 219—124.34 **16 Claims**



1. A process for the lateral positioning of a member relative to a joint formed between two metal surfaces and having discontinuities and using at least one eddy current probe having a given axis, said process comprising the steps of:

processing by differential measure a signal supplied by each of said at least one probe, to obtain at least one positioning signal varying with a lateral position of the axis of the said probe relative to an axis of the joint and at least one signal indicating the presence of a discontinuity and generated when the said probe faces a discontinuity of the joint,

performing a servo-control of the position of said member as a function of variations of said positioning signal, and

interrupting said servo-control of the position of said member as a function of variations of said positioning signal and replacing said positioning signal by a calculated positioning signal when a signal indicating the presence of a discontinuity is generated.

4,441,011

ROTARY ARC-WELDING METHOD

Hirokazu Nomura, and Yuji Sugitani, both of Tsu, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

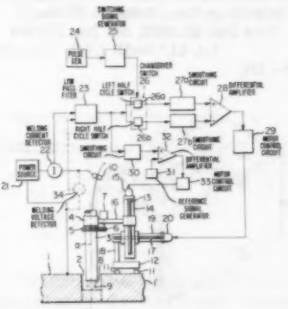
PCT No. PCT/JP81/00357, § 371 Date Jul. 2, 1982, § 102(e) Date Jul. 2, 1982, PCT Pub. No. WO82/01839, PCT Pub. Date Jun. 10, 1982
PCT Filed Nov. 27, 1981, Ser. No. 396,909
Claims priority, application Japan, Nov. 28, 1980, 55-166719
Int. Cl.³ B23K 9/12
U.S. Cl. 219—124.34 **2 Claims**

1. In a rotary arc-welding method, which comprises:

directing a nozzle substantially vertically toward a groove formed between objects of welding; directing a welding electrode through said nozzle eccentrically from the center axial line of said nozzle and substantially vertically toward said groove; feeding a welding current of a prescribed voltage and a prescribed current to said welding electrode to produce an arc between the tip of said welding electrode and said groove to weld said objects of welding with each other along said groove by means of the arc heat; rotating said nozzle to cause a circular movement of said arc from the tip of said welding electrode corresponding to the eccentricity thereof; feeding a shielding gas toward said groove to shield said arc and said groove from the open air; detecting at least once, for each one rotation of said nozzle, a value of variation of one of said voltage and said current of said welding current, for each of the left half cycle and the right half cycle relative to a vertical plane parallel to the welding direction and including said center axial line of said nozzle; calculating, for said each one rotation, the difference between respective values for said left half cycle and said right half cycle of said detected value of variation; and, controllably moving, for said each one rotation, said nozzle at right angles and horizontally to said welding direction so that said calculated difference becomes null;

the improvement comprising:

continuously detecting, for each one rotation of said nozzle, said value of variation for each of said left half cycle and said right half cycle;



smoothing, for said each one rotation, respective values for said left half cycle and said right half cycle of said detected value of variation;

calculating, for said each one rotation, the difference between the thus smoothed respective values for said left half cycle and said right half cycle of said detected value of variation; and,

controllably moving, for said each one rotation, said nozzle at right angles and horizontally to said welding direction so that said calculated difference becomes null;

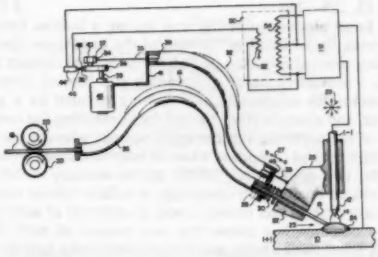
thereby aligning said center axial line of said nozzle with the center of the two opposite faces of said groove.

4,441,012

METHOD AND APPARATUS FOR CONTROLLING HEATING POWER DURING THE APPLICATION OF MOLTEN FILLER MATERIAL TO A WORKPIECE

James D. Risbeck, and Ernest B. Cooper, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 14, 1981, Ser. No. 330,116
Int. Cl.³ B23K 9/09
U.S. Cl. 219—137 R **19 Claims**



1. In a method for applying filler material to a workpiece in which an end of a filler wire of the filler material is melted in

a heat producing means to provide a heating/molten pool region deposited on the workpiece, the improvement comprising:

introducing the filler wire into the pool region in a reciprocating manner to alternately advance the end of the filler wire into and out of the pool region; and

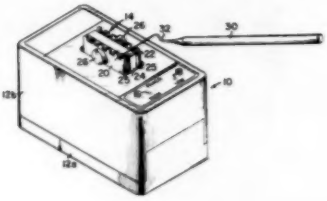
varying the heat produced by the heat producing means so that peak heating pulses are initiated when the advancing end of the filler wire contacts the pool region; and maintaining the peak heating pulses until the filler wire is withdrawn from the pool region.

4,441,013

DENTAL INSTRUMENT HEATER

Carl J. Masreliez, King County, Wash., assignor to American Analytic Technology, Inc., Redmond, Wash.

Filed Jun. 15, 1981, Ser. No. 273,906
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—231 **9 Claims**



1. An electric heater for an electrically conductive dental instrument, comprising a source of electrical power and a pair of electrical contacts connected to said electrical power source, said electrical contacts including a pair of electrically conductive blades, each having a plurality of rectangular notches formed along one edge, said blades being mounted in transverse spaced-apart relationship with the notches of said blades being positioned adjacent each other, said notches having a width which is larger than the transverse dimension of said dental instrument and being free of any obstruction along a line extending transversely between and beyond adjacent notches so that said dental instrument may be inserted between adjacent notches while projecting transversely therefrom, thereby allowing current from said source to heat said dental instrument.

4,441,014

ELECTRIC SOLDERING IRON TEMPERATURE ADJUSTABLE BY CHANGING HANDLE POSITION DURING USE

Rong-Fu Hong, No. 401 Chiu-Ju 2 Rd., Kaohsiung, Taiwan

Filed Jul. 17, 1981, Ser. No. 284,403
Int. Cl.³ B23K *3/04*; H05B *3/02*
U.S. Cl. 219—240 **3 Claims**

1. In an electric soldering iron having a hollow handle, a soldering tip mounted at one end of the handle, an electrical heating element mounted on sad tip in thermal contact therewith, a protective cover surrounding said heating element, a connector for connecting said heating element to a power source, and a temperature control for controlling the temperature of the soldering tip, the improvement wherein said temperature control comprises, a circuit board mounted within the handle, two double pole, double throw mercury switches on said circuit board, each comprising a hollow tubular casing, a mercury drop in said casing, a pole at each end of said casing, and a common line connecting one contact of each of said poles, a first switch being positioned substantially lengthwise in the handle and a second switch being positioned substantially cross-wise in the handle, so that when the handle is substantially horizontal neither switch is actuated and when tilted vertically about said tip said first switch is actuated and when rotated about the longitudinal axis of the handle said second switch is actuated, three groups of resistance elements on said circuit board comprising a first group connected in series through a diode with one end pole of said first switch and adapted to energize said heating element to heat said tip to a preparation temperature when said handle is tilted vertically with the tip above the handle, a second group connected in series with the other end pole of said first switch, a third group having a lower resistance than said second group connected in

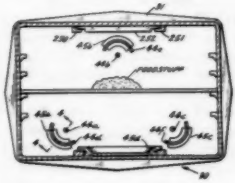
series with one end pole of said second switch, said first group having a lower resistance than said second and third group and being further connected in series with the other end pole of said second switch, said common line of said first switch being connected to said common line of said second switch and a first terminal of said heating element, and said first group being connected to the non-common contact of said other end pole of said second switch, said first, second and third groups being connected to one terminal of said connector, the other terminal of said connector being connected to the second terminal of said heating element.

4,441,015

COOKING APPARATUS EMPLOYING A ROTISSERIE MODE WITH STATIONARY FOOD

Charles W. Eichelberger, Schenectady; Robert J. Wojnarowski, Ballston Lake, both of N.Y., and William D. Ryckman, Jr., Orange, Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,806
Int. Cl.³ H05B *1/02*; F27D *11/02*; F24C *7/04*
U.S. Cl. 219—411 **18 Claims**



1. An interior oven structure comprising:

a cooking container;

means within said cooking container for supporting foodstuff in a general central location therein;

a plurality of electrically individually-energizable cooking heat sources contained totally within said cooking con-

tainer and spaced from and symmetrically surrounding said generally central location which receives said foodstuff:

electrical switching means connected to said plurality of electrically individually-energizable heat sources for selectably sequentially switching power to selected ones of said plurality of heat sources to cause the heat energy therefrom to impinge from a cyclically rotating variable direction upon all associated surfaces of said foodstuff and produce rotisserie-type cooking; and

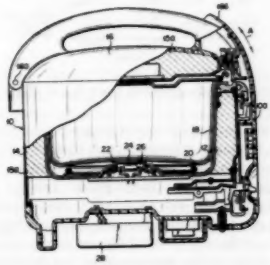
duty cycle control means connected to said electrical switching means for variably controlling in the selected sequence the switching time and duration characteritics in which said selected ones of said plurality of heat sources are individually energized and deenergized.

4,441,016

ELECTRIC RICE COOKER

Hiroyuki Oota, Iwakura; Terutaka Aoshima, Toyohashi; Kenji Yamamori, and Ryuho Narita, both of Nagoya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 27, 1983, Ser. No. 461,494
Claims priority, application Japan, Jan. 30, 1982, 57-14559
Int. Cl.³ F27D *11/02*
U.S. Cl. 219—441 **11 Claims**



1. An electric rice cooking apparatus for performing main cooking and subsequent auxiliary cooking for effectively converting beta-starch to alpha-starch, comprising:

(a) a cooking kettle for containing rice and water;

(b) thermal insulating frame means for detachably placing said cooking kettle therein;

(c) heater means disposed in said frame means, for receiving power and for electrically generating heat to heat said cooking kettle and contents thereof;

(d) temperature detecting means for measuring the actual kettle temperature of said cooking kettle and for producing a detection signal corresponding to the actual kettle temperature;

(e) first controlling means, connected to said temperature detecting means and said heater means, for storing first and second reference temperatures, for deenergizing said heater means to complete the main cooking at a proper time when the kettle temperature increased by heating by said heater means reaches the first reference temperature, and for energizing said heater means again to initiate the auxiliary cooking when the kettle temperature decreased by deenergization by said heater means reaches the second reference temperature;

(f) auxiliary cooking operating time determinating means connected to said first controlling means, for electrically detecting the actual lapse time required for the actual kettle temperature to reach the second reference temperature after the main cooking is completed in every cooking operation, for determining a cooking amount in accordance with the time interval, and for producing a time data signal representing a reference timer operating interval corresponding to an auxiliary cooking operating time in accordance with the cooking amount; and

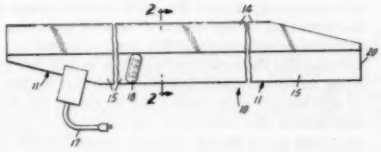
(g) second controlling means, connected to said auxiliary cooking operating time determining means and said heater means, for measuring the actual lapse time of the auxiliary cooking, and for finally deenergizing said heater means independently of said first controlling means when the length of the actual lapse time is equal to said reference timer operating interval, thereby completing the auxiliary cooking operating time.

4,441,017

FLEXIBLE STRIP HEATER

Mark D. Sorlien, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 2, 1983, Ser. No. 471,508
Int. Cl.³ H05B *3/34*
U.S. Cl. 219—528 **6 Claims**



1. An electrical strip heater for wrapping in an overlapping spiral around and applying heat to elongate generally cylindrical objects, comprising:

a thin, flexible, elongate fiber reinforced base having a uniform width along a majority of its length,

resistance wire insulated within said base along the length and across a uniform portion of the width of said base to provide for resistance heating along the length of said base across said uniform portion of its width, and

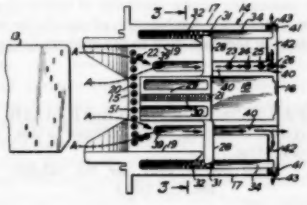
a flexible insulating layer overlying only a portion of one surface of said base and bonded thereto, extending the length of said base parallel to said portion of said base containing said resistance wire and having a width equal to that of said portion of said base containing said resistance wire, said insulating layer having a transverse cross-section that is generally rectangular.

4,441,018

CARD READER WITH AIR PASSAGE CLEANING STRUCTURE

Kenneth R. Wessel, White Plains, N.Y., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Jan. 6, 1982, Ser. No. 337,490
Int. Cl.³ G06K *7/10*
U.S. Cl. 235—458 **10 Claims**



1. An optical punched-card reading apparatus for use with a punched data card having a plurality of columns and rows, said apparatus comprising an assembly of components designed to

channelize air flow through said apparatus for removing foreign matter therefrom, said components, including:

a substantially rectangular first plate having opposed first and second surfaces, and front, rear and two opposed side edges, the first surface of said first plate having a recess extending rearwardly from the front edge thereof and dimensioned to slidably accept the data card, said first plate further including a first row of data sensing apertures disposed in said recess parallel to the front edge of said first plate, said first row of data sensing apertures corresponding in number and spacing to the rows on the data card, said first plate further including a first strobe aperture centrally located in said recess, said data sensing and strobe apertures extending through to the second surface of said first plate, said first plate further including at least one air passageway defining an elongated channel in said recess, said air passageway extending continuously from a point intermediate the edges of said first plate and rearward the first row of data sensing apertures to at least one exit at least one said edge of said first plate, whereby said air passageway in said first plate accommodates air flow for removing foreign matter from said apparatus;

a second plate with opposed first and second surfaces having substantially the same configuration as said first plate and being mounted on said first plate such that the first surface of said second plate covers the recess on the first plate, said second plate including a second row of data sensing apertures and a second centrally located strobe aperture, each said aperture on said second plate extending from the first surface to the second surface thereof and being in register with a corresponding aperture on said first plate forming a pair of registered apertures, said first surface of said second plate further including at least one air passageway defining an elongated channel extending continuously from a point intermediate the edges of said second plate and rearward of said second row of data sensing apertures to at least one exit from said punched-card reading apparatus, whereby said air passageway in said second plate accommodates air flow for removing foreign matter from said apparatus;

a light sensitive sensor mounted within one aperture of each said pair of registered apertures, and a light source mounted in the other aperture of each said pair of registered apertures;

electrical means for connecting said light sources and said light sensors to a readout device and power source;

a strobe generating slide for cooperating with the data card to generate intermittent light signals as the data card is inserted into said apparatus, said strobe generating slide being mounted in the space formed by said recess of said first plate and the first surface of said second plate such that said slide is slidably movable toward and away from the front and rear edges of said first plate; and

a housing for enclosing said assembly of components, whereby the movement of the data card passed the row of data sensing apertures of said first and second plates along with the simultaneous movement of said strobe generating slide passed the strobe apertures of said first and second plates generates a combination of signals for transmitting the data on the data card to the readout device.

4,441,019

WAVEFRONT SENSOR WITH ASTIGMATIC OPTICS

John W. Hardy, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

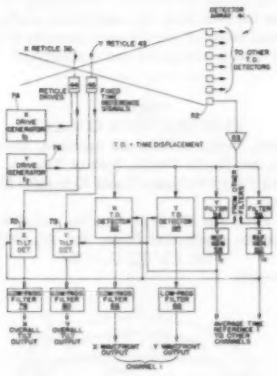
Filed Jan. 28, 1982, Ser. No. 343,653
Int. Cl.³ G01J 1/20
U.S. Cl. 250—201 **7 Claims**

1. A relatively simple wavefront sensor, comprising:

a. an astigmatic optical system for focusing an incident wavefront to x and y focal planes along on optical axis, with the x and y focal planes being displaced from each other along the optical axis because of the astigmatic nature of the optical systems;

b. an x modulation reticle positioned at the x focal plane, and an x drive means for moving the x modulation reticle, substantially perpendicular to the optical axis, to modulate the wavefront at the x focal plane at a frequency f_x;

c. a y modulation reticle positioned at the y focal plane, and a y drive means for moving the y modulation reticle, substantially perpendicular to both the optical axis and the direction of oscillation of the x modulation reticle, to



modulate the wavefront at the y focal plane at a frequency f_y; and

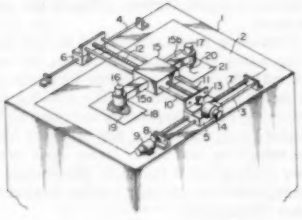
d. a two-dimensional detector means positioned substantially perpendicular to the optical axis to detect the wavefront at a two-dimensional array of zones after it has passed through the x and y focal planes and for producing an output signal for each zone indicative of the light detected in that zone such that the time relationships between the signals produced for the different zones are representative of the slope of the wavefront in the different zones.

4,441,020

METHOD FOR TRACING AN OBJECT

Takashi Sakamoto; Tetsuo Sano, and Eiji Kodama, all of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 3, 1981, Ser. No. 269,952
Claims priority, application Japan, Jun. 5, 1980, 55-75820
Int. Cl.³ G05B 1/00
U.S. Cl. 250—202 **8 Claims**



1. A method for tracing an object wherein the object is sensed by a set of sensing elements included in an optical head which moves along the object, to detect a position and a direction of the object, wherein the optical head is controlled to trace the object depending on the detected position and the direction of the object, and wherein the object is reproduced by reproduction means which is moved in synchronization

with the optical head, the improvement comprising the step of moving the optical head along portions of the object, which the sensing elements can discriminate hardly or not at all nor follow the object, according to line segment data which are stored previously by coordinate reading means and may be predetermined and represent a plurality of points of coordinates.

4,441,021

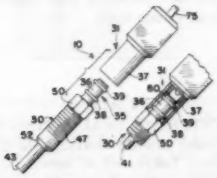
LUMINOSITY PROBE FOR DIESEL ENGINE TIMING APPARATUS

Gene E. Olson, Kenosha, Wis.; Jerome A. Thompson, Milford, Mich.; Donald D. Grover, Kenosha, Wis.; Christopher B. Stout, Kenosha, Wis., and Thomas P. Becker, Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jul. 23, 1981, Ser. No. 285,942

Int. Cl.³ G02B *5/14*

U.S. Cl. 250—227 **17 Claims**



1. A luminosity probe for diesel engine timing apparatus, comprising a tubular body member having an inserting portion adapted to be mounted in an opening into the combustion zone of a selected engine cylinder, one end of said body member being exposed to light in the combustion zone, said tubular body member having a projecting portion projecting beyond the cylinder exterior, a light pipe within said body member, resilient sealing material on said projecting portion, a tubular detector housing telescopically receiving said projecting portion and being constructed to deform said resilient sealing material, whereby said resilient sealing material establishes a detachable, frictional, light-tight and thermally insulated connection between said body member and said detector housing, and whereby said body member and said detector housing relate in push on, pull off manner and said optical detector is insulated from combustion heat, an optical detector within said detector housing in effective relation with the adjacent end of said light pipe, said optical detector including means for converting optical energy signals in said light pipe derived from combustion within the cylinder to electrical energy signals, and output means for the electrical energy signals.

4,441,022

COATING THICKNESS MEASURING DEVICE

Boris B. Joffe, Buffalo; Jerry J. Spongr, Tonawanda, and Byron E. Sawyer, North Tonawanda, all of N.Y., assignors to Twin City International Inc., Amherst, N.Y.

Filed Apr. 27, 1981, Ser. No. 257,975

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—308 **22 Claims**

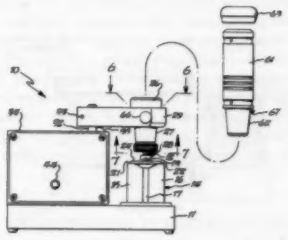
1. A coating thickness measuring device for measuring the thickness of coatings applied to parts, said device comprising:

a base;

positioning means on the base for receiving and positioning a part having a coating thereon, the thickness of which is to be measured;

a probe provided with a radiation source and a radiation detector and having an aperture through which radiation can pass;

supporting means carried by said base and capable of supporting said probe for movement between a raised position wherein the aperture of said probe is generally vertically spaced above a part carried by said supporting means and a lowered operative position wherein said probe is disposed with said aperture in overlying relationship on said part in order to provide radiation backscatter therefrom, said probe being capable of sensing said radiation backscatter when in said operative position and providing a suitable output signal indicative of the thickness of the coating;



moving means which are capable of moving the probe between the lowered operative position and the raised position and further being capable of permitting the probe to descend from the raised position to its lowered operative position; and

means for controlling the rate of descent of said probe upon release from its raised position so that the impact force of said probe on the part is uniform from part to part when it attains its lowered operative position.

4,441,023

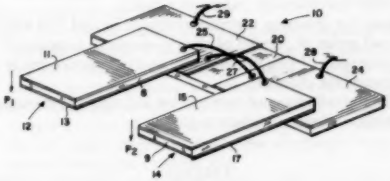
HIGH OUTPUT DIFFERENTIAL PYROELECTRIC SENSOR

Alan P. Doctor, Ormond Beach, and Friedrich H. Oettel, Daytona Beach, both of Fla., assignors to Eltec Instruments, Inc., Daytona Beach, Fla.

Filed Jul. 29, 1981, Ser. No. 288,192

Int. Cl.³ G01J *5/10*

U.S. Cl. 250—338 **22 Claims**



1. A differential thermal sensor having compensation for variations in ambient temperature and for mechanical vibration comprising:

a first elongate thermal detector having a polarized pyroelectric crystal disposed between two conductive electrodes;

a second elongate thermal detector identical to said first thermal detector and having a polarized pyroelectric crystal disposed between two conductive electrodes;

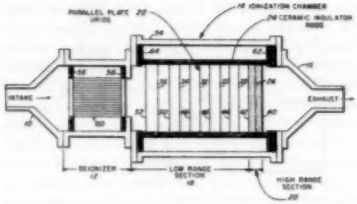
a mounting base, said first detector mounted on said base and extending therefrom in a cantilevered manner, and said second detector mounted on said base adjacent said first detector and extending from said base in a cantilevered manner; and

a pair of conductors conductively attached to said electrodes of said first and second detectors so as to form a parallel opposing connection of said detectors, said pair of conductors also forming output connections for said sensor.

4,441,024
WIDE RANGE RADIOACTIVE GAS CONCENTRATION DETECTOR

David F. Anderson, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 16, 1981, Ser. No. 321,946
Int. Cl.³ G01T 1/18
U.S. Cl. 250—380 11 Claims



1. A wide range radioactive gas concentration detector comprising:

a deionizer for removing charged particles from said radioactive gas;

an ionization chamber coupled to said deionizer;

a first series of parallel plate grid means spaced sufficiently close to provide a first essentially uniform electric field of sufficient intensity to essentially eliminate ion recombination effects in the detection of low concentration radioactive gases, said first series of parallel plate grid means disposed in a first active region of said ionization chamber having sufficient volume to detect said low concentration radioactive gases;

a second series of parallel plate grid means spaced sufficiently close to provide a second essentially uniform electric field of sufficient intensity to essentially eliminate ion recombination effects in the detection of high concentration radioactive gases, said second series of parallel plate grid means disposed in a second active region of said ionization chamber having sufficient volume to detect said high concentration radioactive gases;

means for detecting currents produced in said first and second series of parallel plate grid means in response to the migration of ions produced by said radioactive gas in said ionization chamber;

whereby said detected currents are indicative of the concentration of said radioactive gas.

4,441,025
PROTECTIVE DEVICES

William J. McCoy, Jr., 41 Balsey Rd. South, Stamford, Conn. 06902

Filed Jul. 13, 1981, Ser. No. 282,868
Int. Cl.³ G21F 3/02
U.S. Cl. 250—516.1 6 Claims

1. A protective apparel device comprising

a main body portion having support straps in the shoulder region thereof,

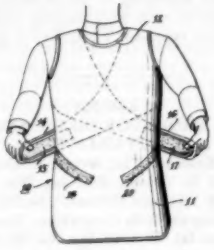
and means to selectively distribute the weight of said device by transfering its weight selectively between the lower body region and the shoulder region of the user,

said means comprising flaps integral with said main body portion for securing said apparel to the body of the user,

said flaps being characterized by

being adapted to cross in the region of the lower back of the user,

having fastening means at their outermost ends for removeable affixation to said main body in selected positions of extension of said flaps about the body of the user with corresponding changes in the degree of tension on said flaps, and

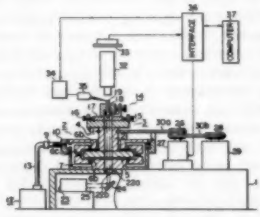


being oriented downward at their outermost ends when affixed to said main body.

4,441,026
CONCENTRICITY EVALUATING SYSTEM

Yoshinaga Moriwaki; Masaki Horike, both of Yokohama, and Masashi Kamiya, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 28, 1981, Ser. No. 315,731
Claims priority, application Japan, Oct. 30, 1980, 55-154178[U]
Int. Cl.³ G01N 21/86
U.S. Cl. 250—561 6 Claims



1. A concentricity evaluating system comprising:

a stage which is supported by a hydrostatic bearing in at least one of radial and thrust directions;

means for detecting the angle of rotation of said stage;

fixing means for fixing a hollow cylindrical member on said stage, which the hole of the hollow cylindrical member coaxially aligned with said stage;

light emitting means for emitting a light beam onto the end face of said hollow cylindrical member or into the hole thereof, thereby clearly indicating the profile of the hole;

optical means for enlarging the image of the profile of said hole;

light receiving means arranged at a predetermined position for receiving a part of the enlarged image transmitted from said optical means;

measuring means for electrically measuring the displacement of the circumference of the hollow cylindrical member while the member is rotating;

interface means for processing output data from said displacement meter, said light receiving means and said rotation angle detecting means; and

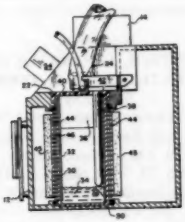
control means for receiving output data from said interface means and for detecting an arithmetic operation on the data.

4,441,027

LIQUID LEVEL CONTROLLER FOR A RESPIRATORY GAS HUMIDIFIER DEVICE

Gerry D. Richardson, and Joseph A. Cairo, both of Marietta, Ga., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 289,558, Aug. 3, 1981, Pat. No. 4,354,984.
This application Apr. 12, 1982, Ser. No. 367,641
Int. Cl.³ G01F *23/02*; G01N *21/21*
U.S. Cl. 250—577 12 Claims



1. In a liquid level sensing device for detecting the liquid level in a canister having an optical probe therein: a bracket carried by a frame and carrying a light source and a light sensing member for determining liquid level in the canister in conjunction with said probe, the improvement comprising, in combination:

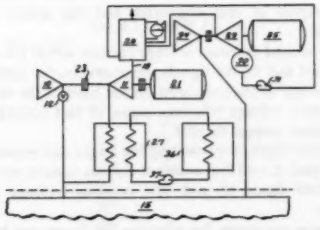
said bracket defining first and second parallel arms having free ends, hinge means between said parallel arms and frame whereby said bracket carrying said light source and said sensing means is permitted to rotate into registry with said probe for liquid level detecting operation in probe-engaging relation and also to rotate out of probe-engaging relation and registry with said probe, whereby the canister may be removed and replaced while the bracket is out of probe-engaging relation, the first arm of said bracket being more flexible than the second arm, and snap-fit means adjacent said first arm positioned to mate with corresponding snap-fit means on the frame, to releasably retain said bracket in a position out of probe-engaging relation.

4,441,028

APPARATUS AND METHOD FOR MULTIPLYING THE OUTPUT OF A GENERATING UNIT

Robert M. Lundberg, 1350 Aster St., Apt. 12D, Chicago, Ill. 60610

Filed Jun. 16, 1977, Ser. No. 807,241
Int. Cl.³ F02C *9/00*
U.S. Cl. 290—52 9 Claims



1. In a power generating apparatus having first and second heat engine means and a compressor directly and mechanically connected to the first heat engine means, the method of generating power in accordance with a variable demand, including the steps of:

establishing a storage reservoir of compressed gas by the continuous operation of said first heat engine means driving the compressor;

operating the first heat engine means continuously at a constant work output and at a constant heat and gas flow input rate, said work output substantially conforming to the average rate of demand of said second heat engine means to generate power,

withdrawing intermittently said stored portion of said compressed gas in said reservoir to a second heat engine means to increase the generation of power as required to satisfy such a variable demand while maintaining said first heat engine means at a constant work output, and

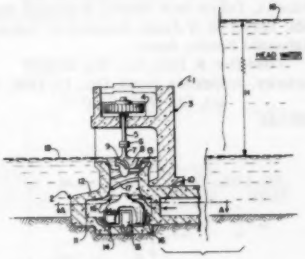
generating power by a power receiving means driven by said second heat engine means, said power receiving means adapted to accept up to the full load output of said second heat engine means, with said second heat engine means withdrawing intermittently said stored portion of said compressed gas from said storage reservoir.

4,441,029

HYDROPOWER TURBINE SYSTEM

David T. Kao, Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.

Filed Jun. 25, 1982, Ser. No. 392,349
Int. Cl.³ H02P *13/20*
U.S. Cl. 290—52 9 Claims



1. A cavitation free, upward flow, low-head hydropower turbine system which comprises

(a) a flow conduit unit inclusive of a runner housing which defines a chamber, a flow intake means which directs fluid into said chamber, said runner housing having an upper narrow portion defining a vertical discharge channel for said fluid, and a valve means positioned beneath said narrow portion of said runner housing within said chamber for controlling said fluid flow discharge from said vertical discharge channel; and

(b) a runner-generator unit including a generator and a fixed blade propeller turbine runner which is at least partially surrounded by the vertical discharge channel of said flow conduit unit.

4,441,030

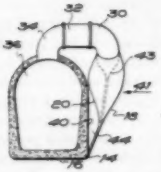
ENERGY CONVERSION APPARATUS

Norman W. Bellamy, Coventry, England, assignor to Sea Energy Associates, Limited, England

Filed Aug. 5, 1982, Ser. No. 405,453
Claims priority, application United Kingdom, Aug. 5, 1981, 8123908
Int. Cl.³ F03B *13/12*
U.S. Cl. 290—53 14 Claims

1. A flexible bag for the energy conversion arrangement indicated herein, wherein the bag is designed to be attached relative to the spine at or along the bottom edge thereof, from which extend front and rear sides of the bag, the front side being for facing the oncoming waves, and the rear side being for location in opposition to the spine, the rear side being

sufficiently free of the spine so that in use water of the body of water can locate behind the rear side and the spine surface keeping the rear surface out of contact with the spine, so that by compression of the bag by an oncoming wave meeting the front surface, the fluid in the bag is forced upwardly by virtue



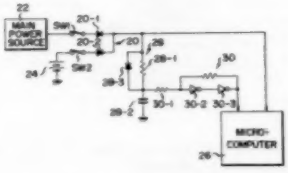
of the reaction of the volume of water between the rear side and the spine, which volume increases in height rather than being expelled from the bag edges, and the bag has coupling passage means at the top for the expulsion of fluid therefrom, and for the intake of fluid thereinto, so that displacement of the fluid can be used to drive a suitable prime mover.

4,441,031

POWER SOURCE VOLTAGE CHANGE DISCRIMINATION CIRCUIT

Yoshiaki Moriya, Tokyo; Ryo Mitani, Kawasaki, and Atsushi Kobayashi, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 9, 1981, Ser. No. 329,058
Claims priority, application Japan, Dec. 10, 1980, 55-174258
Int. Cl.³ H02J 9/00
U.S. Cl. 307—66 **6 Claims**



1. A power source voltage change discrimination circuit comprising:

a main power source terminal to which is applied a main power source voltage;

a reference power source terminal to which is applied a constant reference voltage;

an auxiliary power source terminal to which is applied an auxiliary power source voltage of a level between levels of the main power source voltage and the reference voltage;

voltage selecting means connected to said main power source terminal and said auxiliary power source terminal for selecting the higher voltage of the main and auxiliary power source voltages supplied to said main and auxiliary power source terminals, respectively;

delay means connected to an output terminal of said voltage selecting means for generating an output voltage which is kept substantially constant for a preset period of time after an output voltage from said selecting means is changed, and then becomes equal to the output voltage of said selecting means; and

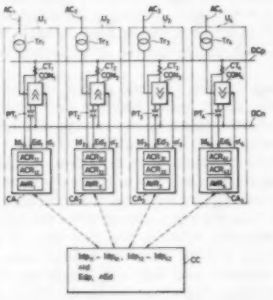
a Schmitt circuit connected to said delay means for generating an output signal corresponding to an output signal from said delay means, said Schmitt circuit having hysteresis characteristics to prevent a change in the output signal of the Schmitt circuit when an output voltage of said voltage selecting means is changed while the input voltage to said Schmitt circuit is kept above the lower level-shift voltage of the Schmitt circuit.

4,441,032

CONVERTER CONTROL APPARATUS FOR PARALLEL CONNECTED MULTI-TERMINAL DIRECT CURRENT SYSTEM

Takeichi Sakurai, Tokyo; Kiyoshi Goto, Musashino; Hiroo Konishi, Katsuta, and Tadao Kawai, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 21, 1982, Ser. No. 341,575
Claims priority, application Japan, Jan. 21, 1981, 56-6330
Int. Cl.³ H02J 1/00
U.S. Cl. 307—82 **12 Claims**



1. In a parallel connected multi-terminal direct current system wherein at least three converters are connected in parallel to direct current transmission lines for operation as inverters or rectifiers, each converter having a converter control apparatus comprising:

first constant current control means for providing a first signal for controlling the current of the converter on the basis of the deviation between a first current reference signal of said converter and the actual current thereof;

second constant current control means for providing a second signal for controlling the current of the converter on the basis of the deviation between a second current reference signal of said converter and the actual current thereof;

first and second constant voltage control means for providing third and fourth signals, respectively, for controlling the voltage of the converter on the basis of the deviation between a voltage reference signal of said converter and the actual voltage thereof;

first selector means for selecting the larger one between said first signal of said first constant current control means and the third signal of said first constant voltage control means;

second selector means for selecting the larger one between said second signal of said second constant current control means and the fourth signal of said second constant voltage control means; and

third selector means for selecting the smaller one between the signals selected by said first and second selector means.

4,441,033

PROCESS FOR THE GENERATION OF HIGH CAPACITY PULSES FROM AN INDUCTIVE ENERGY STORAGE DEVICE

Franz Maier, and Stephan Maier, both of Wettingen, Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

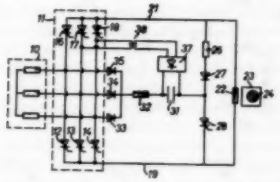
PCT No. PCT/CH81/00087, § 371 Date Aug. 20, 1982, § 102(e) Date Aug. 20, 1982, PCT Pub. No. WO82/02295, PCT Pub. Date Jul. 8, 1982

PCT Filed Jul. 30, 1981, Ser. No. 413,353

Claims priority, application Switzerland, Dec. 22, 1980, 9452/80

Int. Cl.³ H03K *3/00*

U.S. Cl. 307—107 3 Claims



1. A circuit for generating high-voltage pulses, comprising:
an inductive storage unit;
a power source;
at least one thyristor for selectively connecting said power source to said inductive storage unit;
a quenching circuit connected to said inductive storage unit, said quenching circuit having a first branch containing a quenching capacitor;
a discharge circuit connected in parallel with said inductive storage unit, said discharge circuit having a first branch containing a resistor and a unidirectional element connected in series, said first branch of said discharge circuit having a common junction with said first branch of said quenching circuit; and
a quenching thyristor connected to said common junction so as to be in series with each of said quenching capacitor and said resistor and thereby form a second branch of each of said quenching and discharge circuits.

4,441,034

CONTACT-CONTROLLED CAPACITIVE SWITCHING APPARATUS

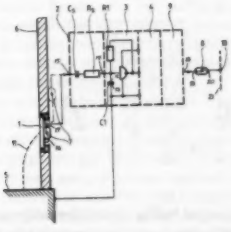
Thomas Iten, Zug, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Nov. 16, 1982, Ser. No. 441,436

Claims priority, application Switzerland, Nov. 26, 1981, 7570/81

Int. Cl.³ B66B *13/24*

U.S. Cl. 307—117 13 Claims



1. A contact-controlled capacitive switching means operating in a non-contact signalling mode and having a contact button, said switching means being located at a storey of a structure and comprising:
an oscillator including a resistor-capacitor element determining the frequency of the oscillator;
said capacitor having two terminals;
a switching circuit series connected to said oscillator;
a coupling member comprising at least one resistor and having a first terminal and a second terminal;
one of said two terminals of said capacitor of said oscillator being connected to the first terminal of said coupling member and the other of said two terminals of said capacitor of said oscillator being grounded, so that upon actuating the contact button there is caused a change in the oscillator frequency and a change of a discrete signal present at an output of the switching means;
a thermal circuit breaker having an input and an output; and
said input being adapted to be connected to said contact button and said output being connected to said second terminal of said coupling member.

4,441,035

CMOS TURN-ON CIRCUIT

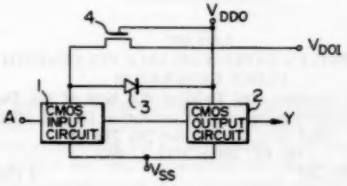
Andreas Demetriou, Carp, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed Oct. 5, 1981, Ser. No. 308,414

Claims priority, application Canada, Jul. 17, 1981, 381955

Int. Cl.³ H03K *17/08, 17/22, 17/284*

U.S. Cl. 307—200 B 7 Claims



1. The combination of a CMOS integrated circuit requiring two different D.C. voltage supplies of similar polarity for simultaneous application to said circuit, means for connecting a higher voltage terminal of said two voltage supplies to said circuit, a field effect transistor having one of its source or drain connected to a lower voltage supply terminal and the other of its source or drain connected to said circuit, and its gate connected to the higher voltage supply terminal whereby during approximately simultaneous application of said supplies to said circuit, the lower voltage supply is not connected to said circuit until after the higher voltage supply is connected to said circuit.

4,441,036

MONOLITHICALLY INTEGRATED CIRCUIT WITH CONNECTIBLE AND/OR DISCONNECTIBLE CIRCUIT PORTIONS

William G. Oldham, El Cerreto, Calif., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,300

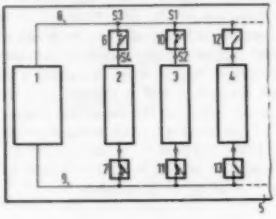
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032306

Int. Cl.³ H03K *17/687;* H01L *27/14;* G11C *7/00*

U.S. Cl. 307—242 11 Claims

1. A monolithically integrated circuit, comprising: at least one circuit portion which is a replacement circuit for other functionally disturbed circuit portions of the same kind in the integrated circuit connectible and disconnectible by at least one switch element from other circuit portions; the switch element having an integrated field effect transistor designed as a MIS structure with a gate insulating layer separating a gate

from a substrate; the gate being directly connected to a reference potential of the circuit; means for selectively charging the gate layer with the gate connected to the reference potential so that an uncharged state of the gate insulating layer can determine a high or low value of a threshold voltage of the transistor when the gate is connected to the reference potential and thus determine a first switching state of the field effect transis-



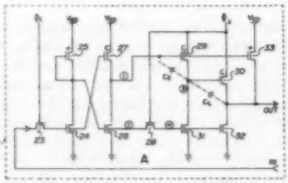
tor while a charged state of the gate insulating layer may determine a low or high value of the threshold voltage opposite from the uncharged state and thus a second switching state of the field effect transistor; and said means for selectively charging comprising an electron beam induced charge in the gate insulating layer which occurs when a channel region of the transistor is scanned while the gate is connected to the reference potential.

4,441,037

INTERNALLY GATED VARIABLE PULSEWIDTH CLOCK GENERATOR

Gregory E. Gaertner, and Ta-Ming Wu, both of San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 22, 1980, Ser. No. 218,479
Int. Cl.[3] H03K *5/13, 17/687*
U.S. Cl. 307—265 3 Claims



1. A circuit apparatus for generating a variable pulsewidth high ramp rate output signal in response to a pair of complementary clock signals and a logic signal, said generator comprising:

a first transistor means disposed for gating therethrough said logic signal in response to a first of said pair of clock signals;

latch circuit means having an input terminal coupled to said first transistor means and having an output terminal;

second transistor means having a gate terminal coupled to said output terminal of said latch circuit means and a first signal terminal coupled to a second of said pair of clock signals;

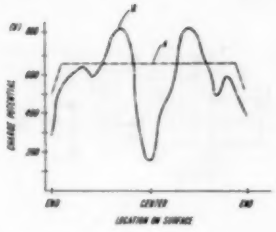
third transistor means having a gate terminal coupled to the second signal terminal of said second transistor, a first signal terminal coupled to said second of said pair of clock signals and a second signal terminal coupled to an output terminal of said circuit apparatus, such that the ramp rate of said output signal is equal to the ramp rate of said second of said pair of clock signals.

4,441,038

ELECTRET DEVICE

Masamichi Tanaka, Yamato, and Hiroto Wada, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 280,056, Jun. 30, 1981, abandoned.
This application Jun. 1, 1983, Ser. No. 499,873
Claims priority, application Japan, Jun. 30, 1980, 55-88778; Jun. 30, 1980, 55-88779; Jun. 30, 1980, 55-88818; Jun. 30, 1980, 55-88820; Jun. 30, 1980, 55-88783; Jun. 30, 1980, 55-88785; Jun. 30, 1980, 55-88786; Jun. 30, 1980, 55-88787
Int. Cl.[3] G11C *13/02*
U.S. Cl. 307—400 14 Claims



1. An electret device comprising:

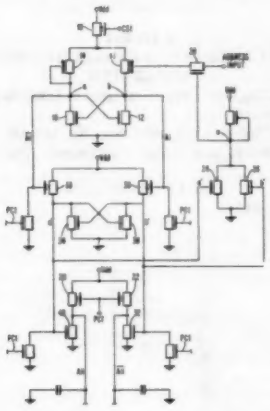
a dielectric body provided with a surface electric charge and having two substantially flat and generally parallel surfaces, a conductive electrode secured on one of said flat surfaces, and a cover body attached on the opposite one of said flat surfaces, whereby said cover body has a uniform surface charge distribution.

4,441,039

INPUT BUFFER CIRCUIT FOR SEMICONDUCTOR MEMORY

Stanley E. Schuster, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,612
Int. Cl.[3] H03K *19/094, 17/04, 3/356;* G11C *8/00*
U.S. Cl. 307—475 1 Claim



1. An address input buffer circuit for address input voltages comprising a differential voltage generator including first and second depletion type transistors each having a source to drain path and a gate electrode, said first depletion transistor con-

nected between a first node and a source of supply voltage and said second depletion transistor connected between a second node and said source of supply voltage,

a source of address input voltage being in one of either a high or low voltage level state, said gate electrode of said second depletion transistor connected to said source of said address input voltage, said second depletion transistor responsive to said high address voltage level state for providing a first polarity differential voltage across said first and second nodes and responsive to said low address voltage level state for providing a second polarity differential voltage across said first and second nodes,

said first and second depletion type transistors each having a source, a drain and a gate electrode, said source and gate electrode of said first depletion transistor connected to said first node and said source electrode of said second depletion transistor connected to said second node, said drain electrodes of said first and second depletion devices being timely connected to said source of supply voltage,

a bistable differential voltage detector including first and second enhancement type transistors each having source, drain and gate electrodes, said drain electrode of said first enhancement transistor and said gate electrode of said second enhancement transistor being connected to said first node and said drain electrode of said second enhancement transistor and said gate electrode of said first enhancement transistor being connected to said second node, and said source electrodes of said first and second enhancement type transistors being connected to reference potential, one of said first and second enhancement transistors conducting in response to said first polarity differential voltage across said first and second nodes for producing a corresponding output voltage on its drain electrode, and the other one of said first and second enhancement transistors conducting in response to said second polarity differential voltage across said first and second nodes for producing a corresponding output voltage on its drain electrode,

a zero threshold transistor device connected between said source of supply voltage and said first and second depletion transistors, and a source of clock pulse signals connected to said zero threshold transistor device for turning said zero threshold transistor device on and applying said supply voltage to said first and second depletion transistors for operating said differential voltage generator,

a static memory interface structure connected to said source of supply voltage and to first and second nodes of said differential voltage generator and said bistable differential voltage detector, said static interface memory structure having first and second output address lines,

a switching device having a first and a second side, said switching device being connected on one side to said source of address input signals and said gate of said second depletion transistor and the other side of said switching device being connected to said static interface memory structure,

a source of precharge pulse signal connected to said static interface memory structure, said precharge pulse signal from said source functioning to raise said output address lines of said static interface memory structure to a high level and actuating said switching device, causing said address input voltage to be applied to said gate electrode of said second depletion transistor,

and said static interface memory structure being responsive to said corresponding output voltages from said bistable differential voltage detector on said first and second nodes for discharging one or the other corresponding precharged first and second output address lines to a low level, the other one of said first and second output address lines remaining at said high level, and wherein said address input signal is maintained on said gate of said second depletion device of said differential voltage detector until the occurrence of a subsequent precharge pulse signal.

4,441,040

INTEGRABLE SEMICONDUCTOR CIRCUIT WITH A NEGATIVELY FED-BACK, NON-INVERTING OPERATIONAL AMPLIFIER

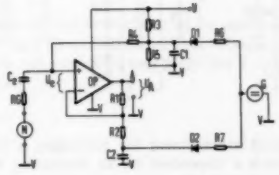
Gerald Mündel, Glonn, and Michael Lenz, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft GmbH, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,526

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3114042

Int. Cl.[3] **H03K** *17/74*; **G06G** *7/10*

U.S. Cl. 307—491 **4 Claims**

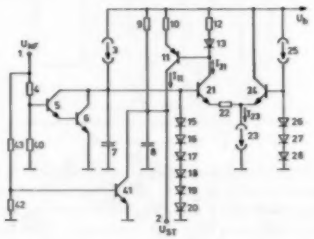


1. Integrable semiconductor circuit, including a negatively fed-back non-inverting operational amplifier having a signal output, an inverting and a non-inverting signal input and supply inputs, a first resistor connected between the signal output and the inverting input of the operational amplifier, a second resistor being connected to the inverting input of the operational amplifier and to the output of the operational amplifier through the first resistor, first and second capacitors, the second capacitor being connected between the second resistor and reference potential, forming a voltage divider including the first and second resistors and the second capacitor connected between reference potential and the output of the operational amplifier with a first circuit point disposed between the second resistor and the second capacitor connecting the inverting input of the operational amplifier to reference potential, an operating potential source being connected to one of the supply inputs of the operational amplifier and the other supply input being connected to reference potential together supplying the operational amplifier with a supply voltage, series-connected third and fourth resistors having a second circuit point disposed therebetween, said series-connected third and fourth resistors being connected between the operating potential source and the non-inverting input of the operational amplifier, a fifth resistor connected between the second circuit point and reference potential, and the first capacitor being connected in parallel with the fifth resistor, wherein the improvement comprises an auxiliary d-c voltage source having a first pole connected to reference potential and a second pole, first and second diodes each having an anode connected to said second pole of said auxiliary d-c voltage source and a cathode, one of said series-connected third and fourth resistors connected between the supply potential source and the non-inverting input of the operational amplifier being additionally connected between the cathode of said first diode and the non-inverting input of the operational amplifier, and the cathode of said second diode being connected to said first circuit point.

4,441,041
CIRCUIT ARRANGEMENT FOR GENERATING A DIRECT CONTROL VOLTAGE WHICH IS DEPENDENT ON AN ALTERNATING VOLTAGE

Ernst Schröder, Hanover, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Jun. 17, 1982, Ser. No. 389,494
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124289
Int. Cl.³ H03G *3/10*
U.S. Cl. 307—494 **11 Claims**



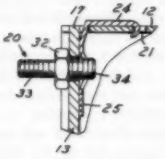
1. A circuit arrangement for generating a direct control voltage which is dependent on an alternating voltage input signal, particularly for dynamic compression or expansion, said circuit arrangement comprising, in combination: an input terminal for an alternating voltage input signal; a first charging capacitor; a first charging circuit means for charging said first capacitor; a first discharging circuit means, controlled by the signal at said input terminal, for discharging said first capacitor; a second charging capacitor whose charge voltage constitutes said control voltage; a second charging circuit for charging said second capacitor; a second discharging circuit means, controlled by the signal at said input terminal, for discharging said second capacitor; a third charging circuit means, connected in parallel with said second charging circuit means, for charging said second capacitor, said third charging circuit means including a controllable current path which is actuated when the voltage of said first charging capacitor exceeds a given threshold value and further circuit means for causing the charging current of said third charging circuit means to have a first current value at a voltage across said first charging capacitor below said threshold value and a second value when said voltage is above said threshold value with said first or second value being proportional to the voltage of said first charging capacitor up to a limit value, and with the range of said first value immediately following the range of said second value.

4,441,042
ELECTRIC MOTOR

Robert Colwell, Owosso, Mich., assignor to Univeral Electric Company, Owosso, Mich.

Filed Sep. 28, 1982, Ser. No. 425,414
Int. Cl.³ H02K *15/00*
U.S. Cl. 310—42 **15 Claims**

1. An electric motor comprising:
a motor,
said frame comprising a generally cylindrical shell,
a stator,
said shell encircling said stator,
a rotor,
a pair of end members on the ends of said shell and rotatably supporting said rotor,
said shell having a plurality of circumferentially extending slots spaced from an edge of said shell,
said shell having a plurality of notches in said edge aligned with said slot,
a plurality of spring nuts, each said spring nut having a first leg with one end thereof hooked into said slot and extending along the outer surface of said shell,
each said nut having a second leg extending radially inwardly through said notch in underlying relationship to said end member associated with said end of said shell,
said end member having an opening therethrough,
said second leg of each said spring nut having a threaded opening aligned with the opening in said end member,
and a plurality of studs,

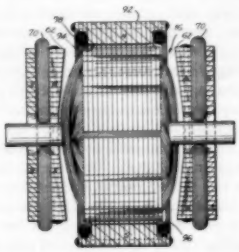


each said stud having a threaded end and an enlarged shoulder portion,
said threaded end extending through said opening in said end member and being threaded into the opening of said spring nut elastically deforming the second leg of the spring nut in tight engagement with the underside of said one end member,
said shoulder portion of each said stud engaging the outer surface of said end member.

4,441,043
COMPOUND INTERACTION/INDUCTION ELECTRIC ROTATING MACHINE

Dominic DeCesare, 223 Center St., Elizabeth, N.J. 07202

Filed Nov. 24, 1980, Ser. No. 209,646
Int. Cl.³ H02K *37/00*
U.S. Cl. 310—46 **32 Claims**



1. A dynamoelectric machine comprising:
a frame;
a rotatable shaft supported by said frame;
a cylindrical rotor mounted coaxially on said shaft, said cylindrical rotor defining two axial end surfaces each substantially in a plane normal to said shaft and a cylindrical circumferential surface coaxial with said shaft between said axial end surfaces, said rotor being provided with a plurality of rotor coil winding grooves which are generally parallel to said shaft and substantially uniformly spaced from each other about said circumferential surface;
a distributed armature winding having axial portions parallel to said shaft and received within said rotor grooves and radial portions in the region of said end surfaces and extending between substantially diametrically opposite grooves with respect to said shaft; and
magnetic field producing means mounted on said frame for producing a first magnetic field directed to interact with

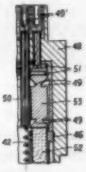
said winding axial portions and second magnetic fields, in the region of at least one axial end surface of said rotor, which are directed to interact with the respective winding radial portions, said winding radial portions at each axial end surface of said rotor creating a build-up of overlapping windings which is minimum at said circumferential surface and gradually increases to a maximum in the region of said shaft, said build-up generally defining a conical convex surface, and said magnetic field producing means being configurated to generally conform to said circumferential and conical concave surfaces to thereby minimize the air gaps between said magnetic field producing means and said winding portions and optimize the coupling between the magnetic fields of said windings.

4,441,044

TRANSDUCER WITH A PIEZOELECTRIC SENSOR ELEMENT

Friedrich Ruckenbauer; Peter Claassen, and Peter Krempl, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed May 14, 1982, Ser. No. 378,272
Claims priority, application Austria, May 20, 1981, 2267/81
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—338 **8 Claims**



1. A transducer for measuring state variables such as pressure and mechanical force, said transducer comprising at least one piezoelectric sensor element for dynamic measurements having contact electrodes, a signal lead being connected to said contact electrodes for carrying the measurement signals from said at least one piezoelectric sensor element which correspond to the values of the state variable to be measured, and at least one additional measuring element for static or quasi-static measurements which in influenced by the state variable to be measured in the same way as said piezoelectric sensor element and which has an additional signal lead independent of said piezoelectric sensor element, wherein said additional measuring element is a plate capacitor whose one plate is mechanically linked to a part of the transducer which will change its position relative to the other plate as the variable to be measured changes, wherein an a/c excitation voltage of variable frequency may be applied via said signal lead to at least one piezoelectric sensor element, and wherein the measurement signals obtained in this way via said additional signal lead of at least one of the other measuring elements may be used for determining the frequency characteristic of said transducer.

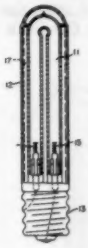
4,441,045

LOW-PRESSURE SODIUM VAPOR DISCHARGE LAMP

Leo M. Sprengers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 195,536, Oct. 9, 1980, abandoned. This application May 25, 1983, Ser. No. 497,215
Claims priority, application Netherlands, Nov. 14, 1979, 7908311
Int. Cl.³ H01J *61/22, 61/34, 61/35*
U.S. Cl. 313—25 **4 Claims**

1. A low-pressure sodium vapor discharge lamp having an operating power of not more than 25 watts, the lamp comprising an elongate discharge tube and an outer bulb enveloping the tube, the discharge tube having an arc voltage of at least 60 volts, a substantially circular cross-section, and first and second internal main electrodes disposed near the respective ends of the discharge tube, the outer bulb being coated with an infrared radiation-reflecting layer predominantly consisting of indium oxide, the reflecting layer being not more than 0.4



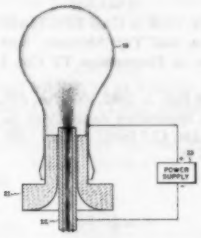
micron thick, the inside diameter of the discharge tube being between 0.4 and 1.0 cm and the electric resistance per square of the infrared radiation-reflecting layer has a value between 3 and 7 ohms.

4,441,046

INCANDESCENT LAMPS WITH NEODYMIUM OXIDE VITREOUS COATINGS

William G. James, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1981, Ser. No. 334,803
Int. Cl.³ H01J *5/16, 61/40*; H01K *1/26, 1/30*
U.S. Cl. 313—112 **6 Claims**



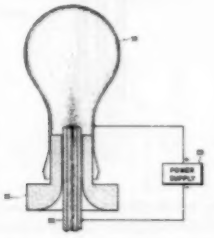
1. An incandescent lamp comprising a sealed glass envelope, a pair of lead-in wires hermetically sealed within said envelope, and a resistive filament connected to said lead-in wires, the improvement which consists of an electrostatically deposited light diffusion coating on the inner surface of said glass envelope sufficient to hide the resistive filament and to absorb light in the green and yellow wavelength region of the spectrum without reducing the light output of said lamp more than approximately 15%, said coating comprising in parts by weight approximately 55–65 parts of a vitreous frit containing neodymium oxide dispersed therein, approximately 10–25 parts flux calcined diatomaceous silica, approximately 10–25 parts fumed silica, and approximately 2–10 parts colloidal hydrophobic silica, all of said silica materials not having a moisture content exceeding about 1 percent by weight.

4,441,047

ELECTROSTATIC SILICA COATING FOR ELECTRIC LAMPS

Clifford B. Collins, Euclid, and William G. James, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,040
Int. Cl.³ H01K 1/32
U.S. Cl. 313—116 6 Claims



1. An electric lamp comprising a bulb having a light diffusing coating on the inside surface thereof comprising an electrostatically deposited powder comprising in parts by weight approximately 35–65 parts flux calcined diatomaceous silica, approximately 35–65 parts fumed silica, and approximately 5–15 parts colloidal hydrophobic silica, said powder having a Coulter particle size between 1 and 6 microns with electrical conductivity in the range from 1×10^{-4} to 2.3×10^{-7} amperes at an applied voltage of 7 kilovolts and 3×10^{-4} to 4×10^{-9} amperes at 2 kilovolts applied voltage.

4,441,048

CATHODE FOR A GAS DISCHARGE TUBE

Hidetugu Takaoka, and Yuji Shimazu, both of Hamamatsu, Japan, assignors to Hamamatsu TV Co., Ltd., Hamamatsu, Japan

Filed Feb. 3, 1982, Ser. No. 345,374
Claims priority, application Japan, Mar. 6, 1981, 56-32900
Int. Cl.³ H01J 1/13, 17/06
U.S. Cl. 313—346 R 6 Claims

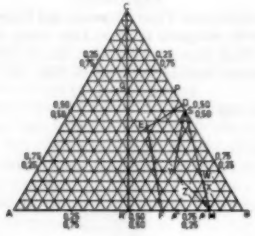
1. A cathode of a gas discharge tube comprising:
a cylinder having outer and inner surfaces;
a double coil surrounding the outer surface of said cylinder, said double coil having an inner diameter which is smaller than the diameter of the outer surface of said cylinder and having a relatively high thermal conductivity;
a cathode material deposited on said double coil; and
a heater positioned within said cylinder surrounded by the inner surface thereof.

4,441,049

LUMINESCENT MATERIAL AND DISCHARGE LAMP CONTAINING THE SAME

Judicus M. P. J. Verstegen; Johannus G. Verlijsdonk; Emiel P. J. De Meester; Willebrordus H. M. M. Van de Spijker, and Johannes G. Verriet, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 144,731, Apr. 28, 1980, Pat. No. 4,382,207, which is a division of Ser. No. 876,826, Feb. 10, 1979, abandoned, which is a continuation of Ser. No. 699,344, Jun. 24, 2976, abandoned, which is a continuation of Ser. No. 410,184, Oct. 26, 1973, abandoned. This application Dec. 16, 1982, Ser. No. 450,488
Claims priority, application Netherlands, Nov. 3, 1972, 7214862
Int. Cl.³ C09K 11/463
U.S. Cl. 313—486 4 Claims



1. A cerium activated luminescent material having a hexagonal crystal structure corresponding to β-alumina,β''-alumina or the hexagonal ferrites, said luminescent material comprising a compound of the oxides MeO, Ce_2O_3, MgO and Al_2O_3, wherein Me represents one of the elements calcium and strontium, and having a composition of the formula

$$Me_{1-x}Ce_xMg_xAl_{12-x}O_{19},$$

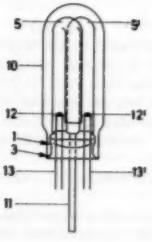
wherein $0.01 \leqq X \geqq 1.0$.

4,441,050

SINGLE-ENDED LOW PRESSURE DISCHARGE LAMP AND METHOD OF MANUFACTURE

Gerhard Steeger, and Josef Plischke, both of Augsburg, Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft Für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,451
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1981, 3139732
Int. Cl.³ H01J 1/92, 9/26
U.S. Cl. 313—493 17 Claims



1. A single-ended low-pressure discharge lamp comprising:
a preshaped stem member (1);

an outer envelope (10) which contains a gas and/or metal vapor filling and which is hermetically sealed to said preshaped stem member (1);

two preheatable electrodes (12, 12') arranged within said outer envelope (10) at said stem member (1); and

at least one generally U-shaped inner tube (5, 5') of glass which is also arranged within said outer envelope (10), said at least one U-shaped inner tube having substantially straight legs (6, 7), a first end (8) of one of said straight legs (6) of each inner tube (5, 5') hermetically surrounding one of said preheatable electrodes (12, 12') and the end of the other straight legs (7) of each inner tube (5, 5') having an aperture (9) open to the interior of said outer envelope (10), said apertures (9) being arranged adjacent said stem member (1);

said stem member (1) comprising a preshaped flare (1) of glass which comprises:

an upper reception section (2) facing the interior of said outer envelope (10) of the lamp and in which are sealingly mounted said two preheatable electrodes (12, 12'), said respective first ends (8) of each U-shaped inner tube (5, 5') also being sealed to said upper reception section (2) of said preshaped flare (1),

a lower, outwardly facing rim (3) which is concentric with the longitudinal axis of the lamp and which is fused to said outer envelope (10); and

a substantially hollow cylindrical middle section (4) connected between said reception section (2) and said rim (3).

4,441,051

LAMP SEAL GLASS

George L. Thomas, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,678
Int. Cl.³ H01J *17/00*
U.S. Cl. 313—579 **3 Claims**

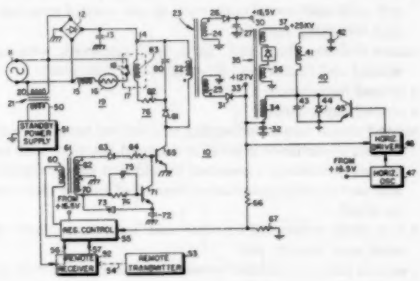
1. An improved regenerative cycle halogen lamp operating at temperatures of at least 500° C. having a transparent glass envelope which includes a resistive incandescent filament connected to a pair of molybdenum inlead wires that are hermetically sealed to the glass envelope, said molybdenum inlead wires being joined to larger diameter inlead wires having greater thermal expansion characteristics in the hermetic seal region, and an inert gas filling which further includes a halogen, wherein the improvement comprises a glass which consists essentially of oxides in approximate percent by weight 52–60 SiO_2, 11–17 Al_2O_3, 11–16 BaO, 8–12 CaO, and 3–7 B_2O_3, along with minor amounts of incidental impurities, residual fluxes, and refining agents, said glass having a liquidus temperature no greater than about 1170° C., a softening point in the approximate range 900°–930° C., a strain point in the approximate range 650°–680° C., a working point in the approximate range 1180°–1240° C., and an average coefficient of linear thermal expansion in the 0°–300° C. temperature range between about $45–50\times10^{-7}$ cm/cm/°C., to reduce both expansion mismatch and thermal stresses otherwise occuring in said hermetic seal region at the lamp operating temperatures.

4,441,052

DEGAUSSING CIRCUIT FOR TELEVISION RECEIVER HAVING SWITCHED MODE POWER SUPPLY

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 26, 1982, Ser. No. 444,542
Int. Cl.³ H04N *9/29*
U.S. Cl. 315—8 **7 Claims**



1. In a television receiver incorporating a degaussing circuit for demagnetizing the picture tube of said receiver, a switched mode power supply comprising:

a transformer incorporating first and second windings, said first winding coupled to a source of voltage, said second winding coupled to at least one load circuit of said receiver;

switch means coupled to said first winding for energizing said first winding from said source of voltage when said switch means is conductive, said second winding responsive to energization of said first winding for developing a voltage across said second winding for producing a voltage to be applied to said load circuit;

means for controlling the conduction of said switch means; and

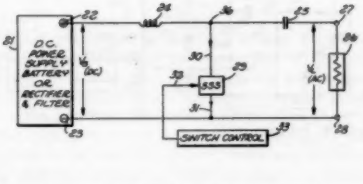
switch means protection means coupled to said first winding and to said degaussing circuit for removing energy from said first winding and applying at least a portion of said energy to said degaussing circuit.

4,441,053

SWITCHED MODE ELECTRODE BALLAST

John I. Daspit, Santa Monica, Calif., assignor to Data-Design Laboratories, Cucamonga, Calif.

Filed Nov. 27, 1981, Ser. No. 325,306
Int. Cl.³ H05B *37/00*
U.S. Cl. 315—206 **27 Claims**



1. In an electronic ballast circuit for operating gaseous discharge lamps, the combination of:

means defining first and second load terminals;

a dc power supply having first and second supply terminals;

an inductance;

a capacitance;

circuit means connecting said inductance and capacitance in series at a junction, with said inductance connected to said first supply terminal and with said capacitance connected

to said first load terminal and with said second supply terminal connected to said second load terminal;

a solid state switch having input and output terminals connected between said junction and said second supply and load terminals, and having a control terminal for opening and closing a circuit between said input and output terminals in response to a switching voltage on said control terminal;

a switch control circuit providing voltage pulses as an output, with said output connected to said control terminal as said switching voltage;

means defining third and fourth load terminals, with said second and fourth load terminals interconnected;

a second inductance;

a second capacitance;

second circuit means connecting said second inductance and second capacitance in series at a second junction, with said second inductance connected to said first supply terminal and said second capacitance connected to said third load terminal;

a first diode connected between said first junction and said solid state switch; and

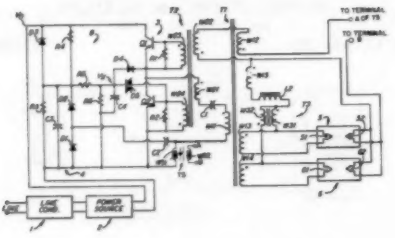
a second diode connected between said second junction and said solid state switch.

4,441,054

STABILIZED DIMMING CIRCUIT FOR LAMP BALLASTS

David L. Bay, Beverly, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 12, 1982, Ser. No. 367,308
Int. Cl.³ H05B *37/02*
U.S. Cl. 315—219 **10 Claims**



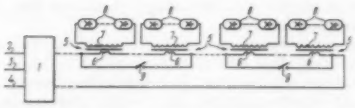
1. In an electronic ballast circuit for a lamp, said circuit having an output transformer including a primary winding and at least one secondary winding adapted for coupling to a lamp filament, a circuit for stabilized dimming of the lamp, said circuit comprising a dimming transformer having a variable inductance primary winding coupled to the primary winding of the output transformer and secondary winding coupled to the secondary winding of the output transformer and adapted for coupling to a lamp filament.

4,441,055

LIGHTING SYSTEM

Povilas I. Balchjunas, Vilnjus; Ionas J. Martinaitis, Kaunas; Sauljus A. Tulaba, Kaunas, and Alfredas B. Pilkauskas, Kaunas, all of U.S.S.R., assignors to Kaunassky Politekhnichesky Institut, Kaunas, U.S.S.R.

PCT No. PCT/SU81/00048, § 371 Date Feb. 4, 1982, § 102(e) Date Feb. 4, 1982, PCT Pub. No. WO81/03731, PCT Pub. Date Dec. 24, 1981
PCT Filed May 29, 1981, Ser. No. 354,095
Claims priority, application U.S.S.R., Jun. 10, 1980, 2938331; Jun. 10, 1980, 2938327; Jun. 10, 1980, 2937598
Int. Cl.³ H05B *37/00*
U.S. Cl. 315—288 **7 Claims**



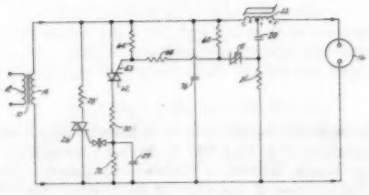
1. A lighting system comprising a source of regulated alternating current and gaseous discharge lamps connected to said source through current transformers, whose primary windings are serially connected and coupled to said source, characterized in that said source (1) comprises frequency converting means whose input terminals are connected to an alternating current power network to convert the power network voltage to a regulated alternating current having a frequency at least three times greater than the network voltage frequency, whereas the series-connected primary windings (6) of said current transformers (5) are connected to output terminals of said frequency converting means.

4,441,056

HIGH PRESSURE SODIUM LAMP BALLAST CIRCUIT

John V. Siglock, Sierra Madre, Calif., assignor to Unicorn Electrical Products, Anaheim, Calif.

Continuation-in-part of Ser. No. 156,766, Jun. 5, 1980, Pat. No. 4,339,695. This application Jun. 1, 1982, Ser. No. 383,468
Int. Cl.³ H05B *41/16*
U.S. Cl. 315—290 **7 Claims**



1. A circuit for driving a gas discharge lamp from a constant current alternating voltage source, comprising:

a transformer having a magnetic core and windings on the core for coupling the voltage source to the lamp, a starting pulse generating circuit coupled to said voltage source by the transformer and having its output connected across the lamp for applying a high voltage starting pulse across the lamp to initiate ionization, the pulse generating circuit being triggered by the rise in voltage during each half cycle of the alternating voltage source, a voltage limiting circuit including a switching element connected across one of the transformer windings for limiting the rise in voltage across the transformer during each half cycle of the voltage source when the switching element is on, and circuit means activated by the starting pulse from said generating circuit for triggering on the switching element

during any half cycle of the voltage source when the impedance of the lamp remains at a high level following the generation of the starting pulse, the switching element being turned off when the voltage goes to zero at that end of a half cycle.

4,441,057

CORRECTION APPARATUS FOR A CATHODE RAY TUBE

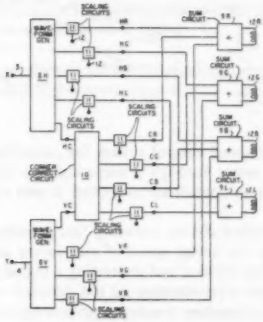
Stanislaw Wrona, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1980, Ser. No. 214,145

Claims priority, application United Kingdom, Dec. 15, 1979, 7943293

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—368 **13 Claims**



1. Correction apparatus for a cathode ray tube, comprising circuitry adapted to generate correction waveforms in accordance with the position of an electron beam, wherein the circuitry comprises hybrid circuitry which computes the correction waveforms as functions of digital value, and

wherein the circuitry comprises analog circuitry arranged in operation to generate correction waveforms in accordance with the positions of the electron beams, the correction waveforms being shaped analog waveforms modified in accordance with the said digital values, and

wherein the correction apparatus is arranged to correct misconvergence in a shadow mask color cathode ray tube, and

wherein the analog circuitry arranged in operation to generate parabolic waveforms, characterized in that the sizes of the waveforms are determined by at least some of the said digital values.

4,441,058

DEFLECTION CIRCUIT WITH LINEARITY CORRECTION

David W. Luz, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 21, 1981, Ser. No. 304,162

Int. Cl.³ H01J *29/56*

U.S. Cl. 315—371 **10 Claims**

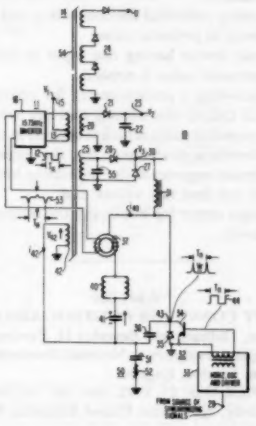
1. A deflection circuit with linearity correction, comprising:

a deflection winding;

a deflection generator including a source of trace voltage and a trace switch coupled to said deflection winding and responsive to a deflection rate switching signal for applying said trace voltage across said deflection winding each deflection cycle to generate scanning current during a trace and a retrace interval of each deflection cycle in said deflection winding, said trace switch incorporating a capacitor for resonating with said deflection winding during said retrace interval;

a source of deflection rate alternating polarity voltage coupled to said resonant capacitor and said deflection winding; and

phasing means for applying said alternating polarity voltage to said deflection winding during said trace interval in proper phase relation to said scanning current in order to



provide linearity correction to said scanning current, said source of alternating polarity voltage being so coupled to be excluded from said retrace resonance such that said alternating polarity voltage is not applied to said deflection winding during said retrace interval.

4,441,059

CUTTING FEED SENSING DEVICE

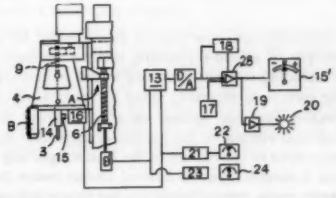
Mitsuru Watanabe, Takata, Japan, assignor to Fuji Seiki Machine Works, Ltd., Shizuoka, Japan

Filed Nov. 16, 1981, Ser. No. 321,959

Claims priority, application Japan, Dec. 12, 1980, 55-177667

Int. Cl.³ G05B *19/24*

U.S. Cl. 318—39 **9 Claims**



1. A feed rate sensing system for a drilling machine or the like and which is equipped for comparison of two potential values, one of which values represents the real value of the feed rate and the other of which values represents the desired value of the feed rate, the drilling machine having a linearly movable cutting tool supporting block carrying a rotatable tool spindle by which it drives taps, drills, and other kinds of cutting tools and makes said tools advance and retract with respect to a workpiece, the linear motion of said supporting block being converted to rotation of a screw by a ball screw appliance, the system comprising:

a pulse generating encoder driven by said screw and spindle for generating feed pulses;

proximity switch means including a segment on said tool spindle and a proximity switch fixed on said tool spindle support and actuated by said actuating segment on the tool spindle for generating a rotation pulse every time the

proximity switch is actuated by rotation of said actuating segment past the switch at every turn of the spindle;

counting means receiving said feed pulses and rotation pulses for producing a digital output representing the real feed rate of the tool supporting block per revolution of the tool spindle;

a digital/analog converter for converting said digital output to an electrical potential value;

an electronic device having one input to which said converted potential value is applied;

a circuit including a potentiometer for converting the desired feed rate of the cutting tool per revolution to an electric potential value which is applied to the other input of said electronic device such that the output of said electronic device represents the difference between the desired and real feed rate values; and

a synchronism meter for displaying the output of said electronic device.

4,441,060

VIBRATORY CONVEYOR CONTROL ARRANGEMENT

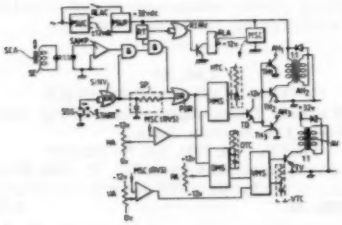
Arthur Hamer, Oldham, and Beverley H. Pardoe, Manchester, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 17, 1981, Ser. No. 244,795

Claims priority, application United Kingdom, Mar. 19, 1980, 8009177

Int. Cl.³ H02K *33/02*

U.S. Cl. 318—114 **15 Claims**



14. A vibratory conveyor control arrangement for a vibratory conveyor of a load-supporting surface defining a load-path and including resilient mounting means permitting vibration of the surface substantially along and normal to said path and respective first and second electrical driving means to bring about said vibrations, the control arrangement including means responsive to the motion of the load supporting surface to produce a motion signal, a control circuit means having a motion signal input, user controls, driving means and energization outputs, means responsive to the motion signal input to produce a first time reference signal edge repeated at intervals in time representing cycles of the conveyor motion along said path and means to produce from the first signal a further signal adjustable in phase from the first signal, means respectively responsive to the first and further signals to produce driving means energization pulses at said outputs at respective times and of independent durations set by said user controls to determine vibration amplitude, the circuit supplying in operation the energizing outputs in a manner determined by the control circuit with reference to the signal representing motion and the settings of the user controls, the control circuit including a start control and means responsive to the operation of the start control to determine the energization for a particular load in accordance with user controls setting only vibration amplitudes substantially along and normal to said path and the relative phase of said vibrations.

4,441,061

MOTOR SPEED CONTROL SYSTEM

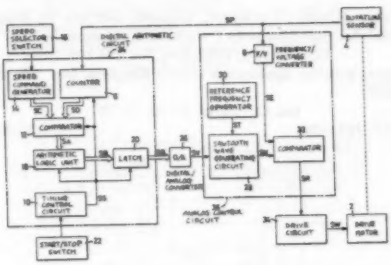
Noriyuki Yoshida, and Yoshimi Asai, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 1, 1982, Ser. No. 394,431

Claims priority, application Japan, Jul. 18, 1981, 56-112562

Int. Cl.³ G05B *5/00*

U.S. Cl. 318—329 **2 Claims**



1. A motor speed control system for controlling the drive current to a motor through a semiconductor element in response to a drive control signal applied to said element, comprising:

a digital control circuit including first detecting means for detecting the actual speed of said motor at a predetermined time interval and generating a digital speed detection signal representative of the detected actual speed, speed commanding means for generating a digital speed command signal corresponding to a predetermined speed of said motor, means for preparing a digital control signal based on a difference between said digital speed detection signal and said digital speed command signal, and latch means for storing said digital control signal in a timed relation with the detection of said actual speed,

a converter for generating an analog control signal corresponding to the digital control signal stored in said latch means, and

an analog control circuit including second detecting means for constantly detecting the actual speed of said motor and generating an analog speed detection signal representative of the detected actual speed, said analog circuit generating said drive control signal in response to said analog control signal and said analog speed detection signal.

4,441,062

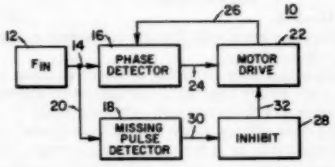
MISSING PULSE DETECTOR FOR A SYNCHRONOUS MOTOR DRIVE

William E. Evans, and Jimmie D. Gillett, both of Garland, Tex., assignors to Varo, Inc., Garland, Tex.

Filed Jan. 29, 1982, Ser. No. 343,749

Int. Cl.³ H02P *3/18*

U.S. Cl. 318—703 **15 Claims**



1. A method for terminating operation of a synchronous motor upon detecting excessive acceleration, missing pulses and undesired pulses in the synchronous motor which is an

integral part of a phase lock loop that is referenced to a driving frequency source, comprising:

receiving an input signal which is the output of the driving frequency source and having a frequency corresponding to the synchronous speed of the motor;

generating a variable frequency reference signal;

adjusting the phase and frequency of the reference signal to provide a constant phase difference between the reference signal and the input signal;

comparing the phase of the input signal to the phase of the reference signal to provide a phase difference signal when the phase between the input and reference signals deviates from the constant phase difference;

outputting a control signal after the difference signal has been present for a predetermined duration of time wherein excessive acceleration results in the presence of the control signal and a missing or undesired pulse also results in the presence of the control signal;

and

inhibiting operation of the synchronous motor in response to the presence of the control signal.

4,441,063

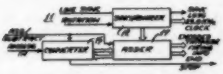
PULSE GENERATING SYSTEM

Richard W. Roof, Lexington, S.C., and Kenneth S. Berton, Monroeville, Pa., assignors to Square D Company, Palatine, Ill.

Filed May 6, 1980, Ser. No. 147,415

Int. Cl.³ H02P 7/42

U.S. Cl. 318—722 **4 Claims**



1. In a pulse generating system for a variable speed motor driven from a power source feeding a three-phase A.C. power line system, said motor having primary and secondary windings and with said source connected to said primary winding and solid state rectifier bridge means connected to said secondary winding to produce a D.C. voltage, said bridge means having solid state switch means for each power line, a solid state inverter connected to receive said D.C. voltage and provide an A.C. voltage output connected to transmit power back to said power source, an inductive reactor connected intermediate said bridge means and said inverter, control means for energizing said switch means and controlling said inverter, the improvement of said control means including a pulse generator connected to receive a synchronizing signal from said power lines dependent of the A.C. frequency, means for receiving a phase reference signal of a magnitude dependent on the difference in phase between the A.C. line voltage and a selected phase angle, logic means for determining the selected advance and retard of said phase angle of said reference signal relative to said synchronizing signal, and adder means for processing and converting said signals to digital outputs for initiating firing pulses to said solid state switch means in selected relation.

4,441,064

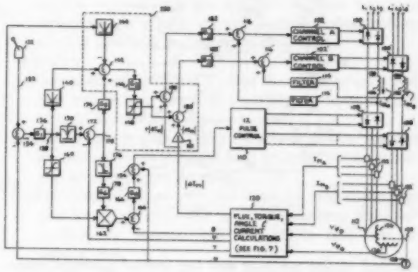
TWELVE-PULSE OPERATION OF A CONTROLLED CURRENT INVERTER MOTOR DRIVE

John H. Cutler, Roanoke, and Loren H. Walker, Salem, both of Va., assignors to General Electric Company, Salem, Va.

Filed Dec. 18, 1981, Ser. No. 332,180

Int. Cl.³ H02P 5/40

U.S. Cl. 318—798 **11 Claims**



1. An ac motor drive for use with an ac motor having a stator and a rotor spaced from said stator by a gap across which gap flux is produced in response to electrical currents supplied to said motor comprising;

(a) a source of variable dc current;

(b) first and second sources of variable frequency polyphase ac current connected to said source of dc current for furnishing a motor current to the motor;

(c) means to develop direct and quadrature flux signals proportional to direct and quadrature components of motor gap flux;

(d) means to develop phase current signals representing, respectively, the current in each phase of the current furnished to the motor;

(e) means responsive to said phase current signals and said flux signals to develop first and second torque signals representing the torque developed by the motor from each of said sources of ac current;

(f) means to sum said first and second torque signals to provide a total torque signal;

(g) means responsive to said total torque signal to develop a single angle signal representative of the instantaneous angle between the gap flux and motor current; and,

(h) means responsive to said angle signal to generate a frequency error signal operative to control the frequency of operation of said first and second sources of variable frequency, polyphase electrical power.

4,441,065

METHOD AND APPARATUS FOR DETERMINING THE ROTOR RESISTANCE OF AN ASYNCHRONOUS MACHINE

Karl-Heinz Bayer, and Felix Blaschke, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens AG, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 13, 1981, Ser. No. 292,724

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034251

Int. Cl.³ H02P 5/40

U.S. Cl. 318—808 **15 Claims**

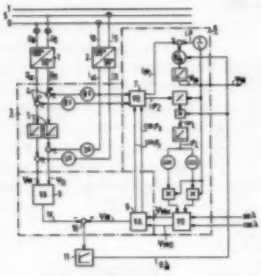
1. A method to detect the rotor resistance of an asynchronous machine, wherein

a first vector attached to the emf of the machine is determined by computing the emf-vector or the flux vector from the stator voltages and the stator currents;

a flux attached to an arithmetic model circuit is determined, whereas the arithmetic model circuit uses the stator cur-

rents and the rotor position of the machine and an adjustable model parameter for the rotor resistance as basic quantities and imitates the dynamic events leading to the magnetic flux of the machine;

a difference of two quantities is determined, wherein the first quantity represents a defining quantity of the first vector



attached to the machine and the second quantity represents a respective defining quantity of a second vector derivable from the imitated flux and that

the setting of a model parameter is varied until the value of the difference is a minimum, whereas the model parameter corresponding to the minimum of the difference is regarded as the resulting rotor resistance of the machine.

4,441,066

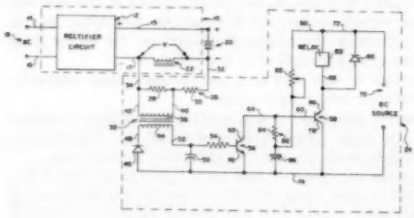
BATTERY CHARGER FAILURE ALARM CIRCUIT

Mark Burmenko, Fairlawn, N.J., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Sep. 28, 1982, Ser. No. 425,873

Int. Cl.³ H02J *7/04*

U.S. Cl. 320—48 **11 Claims**



1. In a battery charger circuit including a source of rectified A.C. voltage coupled for charging a battery connected to said circuit and inductor means, serially connected between said source of rectified A.C. voltage and said battery, for filtering the rectified A.C. voltage prior to application of said battery, A.C. voltage being present across said inductor so long as said battery charger circuit is functioning to charge said battery, a battery charger failure alarm circuit including in combination:

voltage divider means, electrically coupled to said inductor means, for dividing the voltage drop across said inductor means into at least two voltages including a first voltage;

isolation transformer means, electrically coupled to said voltage divider means, for transforming said first voltage into a second voltage;

rectifier means, electrically coupled to said isolation transformer means, for rectifying said second voltage;

a first transistor, said rectified second voltage being applied to the base of said first transistor for switching said transistor means to a conducting state;

a second transistor, the base of which is electrically coupled to said first transistor, said second transistor being switched from a non-conducting state to a conducting state in response to said first transistor being switched to a conducting state; and

alarm means, operating in response to said second transistor, for producing a sensory perceptive signal in the event that said first and second transistors are switched to a non-conducting state in response to the absence of A.C. volt age across said inductor means.

4,441,067

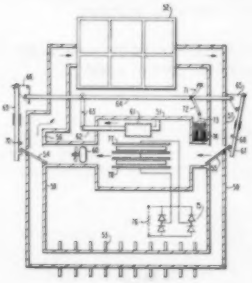
THERMAL DIELECTRIC ELECTRIC POWER GENERATOR

Louis R. O'Hare, 1700 Banyan #3, Fort Collins, Colo. 80526

Filed Oct. 20, 1980, Ser. No. 198,359

Int. Cl.³ H02N *1/00*

U.S. Cl. 322—2 A **11 Claims**



1. An electric power generator comprising:

capacitive charge cycling means in the form of two sets of temperature variable capacitors, a bridge rectifier and an electric load, said bridge rectifier comprising an array of four rectifier elements connected in a series and forming a closed loop in such a manner that two of the rectifier elements have cathodes connected together and the other two elements have anodes at a common connection point, the remaining two junctions of the four rectifier elements being formed by connections between an anode and a cathode, and said capacitor sets and the bridge rectifier being serially connected in such a way that each of the two rectifier element junctions connecting the cathode of one rectifier element with the anode of another is connected to a different capacitor set and each capacitor set is connected to the other, the electric load being connected across the rectifier junction connecting the cathodes of the two rectifier elements and the rectifier junction connecting the anodes of the other two rectifier elements, said capacitive charge cycling means thereby being capable of receiving and of having shared on the sets of capacitors an electric charge which can be placed on them and of having a portion of the charge move back and forth from one capacitor set to the other through the bridge rectifier and the load as the capacitance of the capacitors is made to change repeatedly by temperature variations of the capacitors, and

a fluid heating means in the form of a heat exchanger capable of contacting fluid to be heated with a thermal energy source, and a fluid cooling means providing a source of cooling fluid and being in the form of ducting with cooling fins and located in a cool place, and a temperature alternation means in the form of a fluid impeller having valving and ducting, said impeller being capable of moving a column of fluid, and said valving and ducting being capable of providing alternating fluid flow communication first between the capacitors of the capacitive charge cycling means and the fluid heating means and then in an alternate time period between capacitors of the capacitive

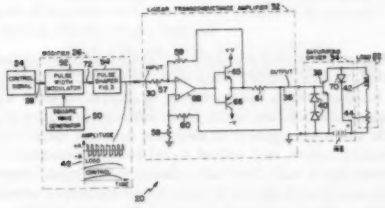
charge cycling means and the fluid cooling means to thereby alternately heat and then cool the capacitors by means of thermal contact with the capacitors by the heated fluid and then by the cooled fluid flowing respectively from the fluid heater and then from the fluid cooler to the capacitors.

4,441,068

BIPOLAR LINEAR CURRENT SOURCE DRIVER AMPLIFIER FOR SWITCHING LOADS

James F. Smith, Smithtown, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Oct. 22, 1981, Ser. No. 314,010
Int. Cl.³ G05F 1/56
U.S. Cl. 323—351 **15 Claims**



1. A system for electrically driving a load, said system comprising:

a linear driver;

a nonlinear driver for applying power to said load, said nonlinear driver being driven by a current having a regulated amplitude put out by said linear driver,

said nonlinear driver comprising means saturable to an extent dependent on the level of said amplitude,

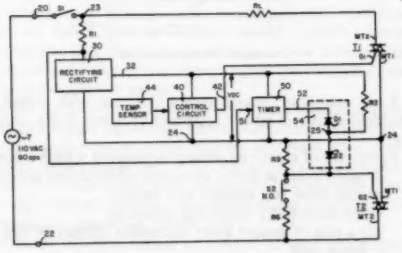
said linear driver comprising a linear transconductance amplifier for applying said current to said nonlinear driver so that said saturable means operates at a predetermined level of saturation, means for adjusting said amplitude of said current, and means for feeding back a portion of said current to said adjusting means, said adjusting means using said fed back current to regulate said amplitude of said current so that said saturable means operates at said predetermined level of saturation when applying power to the load.

4,441,069

SELF-EXTINGUISHING LOAD DRIVING SYSTEM

Robert M. Mendelson, Murray Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 334,818
Int. Cl.³ G05F 5/00
U.S. Cl. 323—239 **7 Claims**



1. The combination comprising:

first and second power terminals for the application therebetween of an AC operating voltage;

first and second control switches, each one of said control switches having a control gate, and first and second main electrodes defining the ends of the main conduction path of the control switch, and each one of said first and second control switches capable of conducting current in either direction along its main conduction path in response to a voltage greater than a given threshold applied between its gate and its first main electrode, each one of said first and second control switches being of the type which can be turned-on only by a turn-on signal applied between its control gate and its first main electrode;

a load;

means connecting the first main electrode of said first control switch and the first main electrode of said second control switch to a common node;

means connecting the main conduction paths of said first and second switches and said load in series between said first and second power terminals;

a first control means coupled between said control gate of said first control switch and said common node for controlling the turn-on and turn-off of said first control switch; and

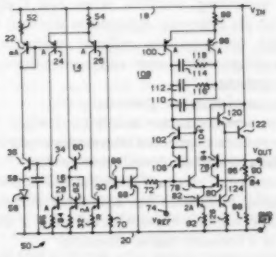
a second control means independent from, and different than, said first means coupled between said control gate of said second control switch and said common node for controlling the conductivity of said second control switch independently of the turn-on and turn-off of said first control switch.

4,441,070

VOLTAGE REGULATOR CIRCUIT WITH SUPPLY VOLTAGE RIPPLE REJECTION TO TRANSIENT SPIKES

Robert B. Davies, Tempe, and Eric D. Joseph, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1982, Ser. No. 352,902
Int. Cl.³ G05F 1/56
U.S. Cl. 323—268 **21 Claims**



1. A voltage regulator for providing a substantially constant voltage supply at an output thereof, comprising:

first and second power supply conductors across which a power supply voltage is connected;

current source means coupled between said first and second power supply conductors for providing first and second currents at respective outputs the magnitudes of each being substantially independent to power supply ripples;

comparator amplifier means including a differential stage having first and second inputs and an output, and a gain stage coupled between said output of said differential stage and said first input thereof and having an output, said outputs of said differential stage and said gain stage being coupled to respective ones of said outputs of said current source means, said first input of said differential stage receiving a reference potential;

amplifier means coupled with said output of said gain stage

and said second input of said differential stage to the output of the regulator; and

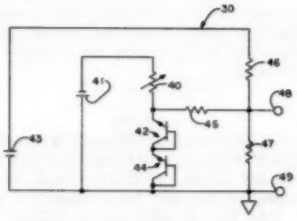
compensation means coupled between said respective outputs of said differential stage and said gain stage for introducing frequency domain zeros and poles into the transfer characteristics of the regulator to provide ripple rejection performance of the regulator.

4,441,071

TEMPERATURE COMPENSATION CIRCUIT FOR THERMOCOUPLES

Robin D. Houseman, La Habra, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 31, 1982, Ser. No. 364,080
Int. Cl.³ G01R *17/02*
U.S. Cl. 323—365 **5 Claims**



1. A circuit for generating a voltage for compensating the output of a thermocouple having at least one reference junction and a measuring junction, when said thermocouple is operated with its reference junction at ambient temperature, wherein said compensation voltage varies linearly with changes in ambient temperature and passing through zero volts at 0° C. comprising:

a first source of constant potential;

at least one semiconductor rectifying device;

a variable resistor connected intermediate said first source of potential and said semiconductor device;

said first source of constant potential and said variable resistor causing a constant but adjustable current to flow in said semiconductor device developing a voltage thereacross in a forward biased direction;

first voltage dividing means for dividing said voltage developed across said semiconductor device;

a second source of constant potential opposite in polarity to said first source of potential;

second voltage dividing means for dividing said second source of potential;

an output terminal wherein the divided voltage of said first voltage dividing means and the divided voltage of said second voltage dividing means are combined at said output terminal and wherein said combined voltage having a voltage temperature coefficient corresponding to a selected thermocouple type over a selected temperature range;

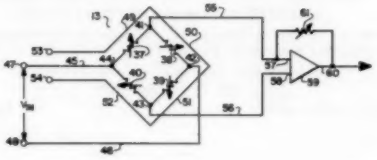
said variable resistor being adjustable to set the combined voltage at said output terminal to a level corresponding to the output of said selected thermocouple type when the measuring junction thereof is at an equivalent temperature and at least one reference junction thereof is at 0° C.

4,441,072

MULTIPLE INPUT OUTPUT ELECTRICAL ISOLATION FOR USE WITH ELECTRONIC INTEGRATED CIRCUITS

Mona A. Rahman, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 12, 1982, Ser. No. 397,649
Int. Cl.³ H03H *1/00*
U.S. Cl. 323—368 **12 Claims**



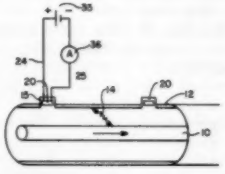
1. Apparatus having a plurality of electrical isolation means provided on a monolithic integrated circuit, each of said electrical isolation means being adapted to receive an input signal at an electrical isolation means input terminating region and to provide an output signal at an electrical isolation means output terminating region, said output signal being representative of said input signal, said electrical isolation means input terminating region and said electrical isolation means output terminating region being electrically isolated from one another and each of said isolation means comprising a first electrical impedance means having first and second terminating regions and being capable of changing in electrical impedance in response to a change in a first magnetic field, said first electrical impedance means being adapted to have a first electrical current established therethrough, and a first electrical conductor means proximate to said first electrical impedance means, said first electrical conductor means being electrically connected to said electrical isolation means input terminating region and being adapted to conduct a second electrical current representative of said input signal.

4,441,073

RESISTIVITY SENSOR SYSTEM FOR DETECTING FAULTS IN SEALED GAS-INSULATED ELECTRICAL APPARATUS

William D. Davis, Ballston Spa, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 22, 1980, Ser. No. 218,785
Int. Cl.³ G01R *31/08;* H02G *15/28;* H01L *7/00*
U.S. Cl. 324—52 **20 Claims**



1. A resistivity sensor system for use with sealed gas-insulated electrical power apparatus to detect faults, comprising:

a plurality of resistivity sensors positioned within a housing of said electrical power apparatus wherein said sensors are spaced from one another and include

(i) an electrically insulating substrate,

(ii) a pair of spaced apart electrodes located on said substrate, and

(iii) a polymer film in the space between said electrodes wherein the occurrence of a fault in the vicinity of said

sensor produces arc by-products that cause a reaction at said polymer film to change the electrical resistivity across said polymer film in accordance with the distance that said sensor is from the location of the fault;

means for applying a voltage across said electrodes;

means for measuring current flowing through said electrodes; and

means responsive to changes in said current flowing through said sensors to indicate which of said sensors is nearest said fault.

4,441,074

APPARATUS FOR SIGNATURE AND/OR DIRECT ANALYSIS OF DIGITAL SIGNALS USED IN TESTING DIGITAL ELECTRONIC CIRCUITS

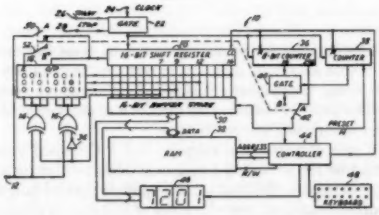
Charles P. Bockett-Pugh, Bracknell, and Brian L. Kett, Poole, both of England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Feb. 24, 1981, Ser. No. 238,384

Claims priority, application United Kingdom, Feb. 28, 1980, 8006829

Int. Cl.³ G01R *31/28, 15/12;* **G06F** *11/00*

U.S. Cl. 324—73 R **5 Claims**



1. Apparatus for testing a digital electronic circuit comprising:

input means for receiving a digital signal from a selected location in the digital electronic circuit;

means for delivering a series of clock pulses, each pulse being coincident with a bit of the digital signal;

switch means for selecting first or second operative modes of the apparatus;

signature generation means connected to the input means to receive said digital signal therefrom and to the clock pulse means to receive said clock pulses to synchronise operation of the signature generation means with said digital signal, and having combining means responsively coupled to said switch means, said combining means being enabled in said first operative mode for combining each of a selected plurality of bits of the digital signal with preselected other ones of the selected plurality of bits of the digital signal, whereby said signature generation means generates successive signature words from the digital signal in said first operative mode, and said combining means being disabled in said second operative mode, whereby said signature generation means receives and temporarily stores said digital signal unchanged in said second operative mode;

counter means connected to the clock pulse means for generating a trigger signal each time a predetermined number of clock pulses has been delivered by said clock pulse means;

storage means connected to the signature generation means and the counter means for responding to a plurality of said trigger signals to store the corresponding contents of the signature generation means; and

additional counter means connected to said clock pulse means and said storage means and responsively coupled to said switch means for inhibiting said storage means from responding to said trigger signals in said second operative mode until a preselected number of clock pulses has been delivered by said clock pulse means;

whereby, in said first operative mode, said apparatus generates and stores successive signature words from said digital signal to permit approximate time of occurrence of any fault in said signal to be determined, and, in said second operative mode, said apparatus stores successive sections of said digital signal starting at the time of fault occurrence determined in said first operative mode, to permit the signal to be analysed.

4,441,075

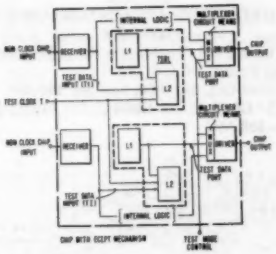
CIRCUIT ARRANGEMENT WHICH PERMITS THE TESTING OF EACH INDIVIDUAL CHIP AND INTERCHIP CONNECTION IN A HIGH DENSITY PACKAGING STRUCTURE HAVING A PLURALITY OF INTERCONNECTED CHIPS, WITHOUT ANY PHYSICAL DISCONNECTION

Maurice T. McMahon, both of Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1981, Ser. No. 280,050

Int. Cl.³ G01R *31/28;* **G06F** *11/00*

U.S. Cl. 324—73 R **12 Claims**



1. An integrated circuit packaging structure said packaging structure comprising:

a substrate having a first planar surface and a second planar surface oppositely disposed from said first planar surface, said first planar surface containing n arrays of closely spaced contact pads, said second planar surface of said substrate containing an array of package contacts, said package contacts of said array contained on said second planar surface of said substrate being more widely spaced apart, one from another, than said contact pads of each of said n arrays of contact pads;

first passive wiring circuit means contained at least in part in said substrate for interconnecting said contact pads of said n arrays of contact pads contained on said first planar surface of said substrate and said package contacts of said array of package contacts contained on said second planar surface of said substrate;

n interconnected integrated circuit chips, each of said n interconnected integrated circuit chips having a first planar surface and a second planar surface oppositely disposed from said first planar surface; each of said n interconnected integrated circuit chips having an array of chip contact pads on said first planar surface thereof, said array of chip contact pads of each of said n interconnected integrated circuit chips respectively corresponding to, and electrically connected to one of said n arrays of contact pads contained on said first planar surface of said substrate, each of said n arrays of chip contact pads providing electrical contact to the integrated circuits contained on the chip corresponding thereto;

each of said n integrated circuit chips containing test circuitry thereon, said test circuitry contained on each of said n integrated circuit chips including at least first and second serially connected test shift register latches (TSRLs),

each said Test Shift Register Latch (TSRL) including a Test Data Port having a test data input (TI) and a test clock input (T);

circuit means serially interconnecting at least a portion of said test circuitry contained on each of said chips, said circuit means connecting said at least first and second Test Shift Register latches (TSRLs) of each of said n integrated circuit chips into a single multi-stage shift register, said circuit means including scan input means of said single multi-stage shift register, scan output means of said single multi-stage shift register and at least A and B clock control means of said single multi-stage shift register, said scan input means, said scan output means and said at least A and B clock control means being respectively accessible via a predetermined limited number of said package contacts of said array of package contacts contained on said second planar surface of said substrate;

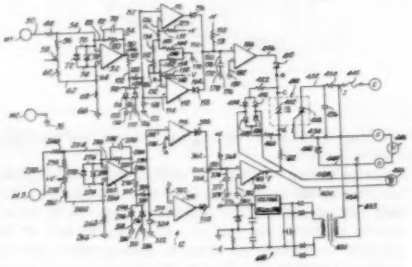
n additional wiring circuit means, each of said n additional wiring circuit means being connected between the test clock inputs (T) of the test Shift Register latches (TSRLs) on one of said n integrated circuit chips, and a single test clock input package contact on said second planar surface of said substrate.

4,441,076

MOTION DETECTION APPARATUS FOR ELECTRIC MOTORS

Matthew C. Baum, 861 Washington Ave., Washington Township, Bergen County, N.J. 07675

Filed Oct. 14, 1980, Ser. No. 196,834
Int. Cl.[3] G01R *31/02;* **G08B** *21/00;* **H02H** *7/09*
U.S. Cl. 324—158 MG **14 Claims**



1. An apparatus for detecting and indicating the motion of an electric motor, comprising: a first channel including

electrical connection means for connecting to a power terminal of said electric motor,

overvoltage protection, input amplifier and broken wire detection means connected to said electrical connection means,

spike rejection means connected to the output of said overvoltage protection, input amplifier and broken wire detection means,

window discriminator means disposed to pass voltages falling between a selected high limit and a selected low limit, with said window discriminator means connected to the output of said spike rejection means,

output detector and time delay means connected to the output of said window discriminator means and disposed to detect output from said window discriminator means and provide an output after a preselected time delay,

output terminal means having at least one pair of output terminals with said output terminal means connected to the output of said output detector and time delay means with said output terminal means disposed to complete a circuit between said output terminals responsive to an output from said output detector and time delay means,

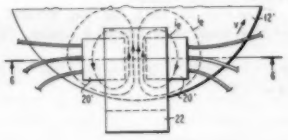
power supply means connected to said output terminal means and output display means connected to said output terminal means and disposed to provide an indication responsive to a lack of voltage present at said power terminals of said electric motor.

4,441,077

REAL TIME EDDY CURRENT RESPONSIVE HALL EFFECT DEVICE TACHOMETER

David F. Dodgen, Boca Raton, and Ludwig R. Siegl, Highland Beach, both of Fla., assignors to International Business Machines, Armonk, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,778
Int. Cl.[3] G01D *3/48, 3/54*
U.S. Cl. 324—164 **2 Claims**



1. A tachometer for providing an analog electrical voltage signal whose amplitude indicates in real time the velocity of a flat, moving, nonmagnetic, electrically conductive member and whose polarity indicates the direction of movement of said member comprising in combination:

(1) a pair of permanent magnets and a C-shaped yoke of material for providing a magnetic circuit including an air gap defined by first and second opposed parallel pole faces corresponding to opposite poles of said pair of permanent magnets;

(2) means for moving said member through said air gap in a plane parallel to said faces so as to induce eddy currents in the surface of said flat member which flow generally in closed loop paths that include parallel segments disposed substantially normal to the direction of movement of said member, said eddy currents causing an eddy current flux field which at the mid-point of said air gap includes lines of induced eddy current flux which are substantially parallel to the lines of permanent magnetic flux in said air gap, said induced eddy current lines of flux disposed on opposite sides of said mid-point of said air gap being in opposite directions whereby the net value of flux at any point in said air gap varies as a function of (a) the velocity of said member; (b) the location of said point relative to said center point; and (c) the distance of said member from each of said parallel faces corresponding to said pole faces;

(3) a first pair of Hall effect sensing devices positioned between said moving member and one said pole face and disposed in spaced apart relationship relative to each other on opposite sides of said mid-point;

(4) a second pair of Hall effect sensing devices positioned between said moving member and said other pole face and disposed in correspondingly spaced apart relationship on opposite sides of said mid-point; and

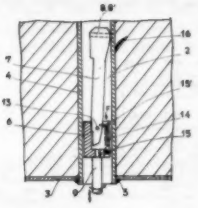
(5) circuit means for (a) first, differentially combining the outputs of said Hall effect sensing device of each pair to provide potential output signals which are indicative of the velocity and direction of movement of said member, and (b) secondly, differentially combining said potential signals from said first and second pair of Hall effect devices to eliminate errors in said indication of velocity resulting from any wobble type movement of said member in said air gap in a direction parallel to said flux lines.

4,441,078

EDDY CURRENT APPARATUS INCLUDING A PROBE ARM PIVOTED FOR MOVEMENT BY CENTRIFUGAL FORCE FOR DETECTING FAULTS IN A METAL PLATE

Jean-Claude Lecomte, Buxy, France, assignor to Framatome, Courbevoie, France

Filed Aug. 26, 1980, Ser. No. 182,410
Int. Cl.³ G01N *27/90*
U.S. Cl. 324—219 **3 Claims**



1. Apparatus for detecting, by means of eddy currents, faults (16) in a metal plate (1) having at least one bore (2), comprising

(a) a differential probe comprising a probe body (6) having two ends, and two coils (8, 8') having their axes located in planes parallel to the plane of said plate (1) and electrically connected to an apparatus for producing and processing eddy current signals;

(b) means for moving said probe in said bore (2) in translation along the axis of said bore (2) and in rotation about the latter, said means comprising a transmission shaft (9) connected to one end of said probe body inside said bore (2),

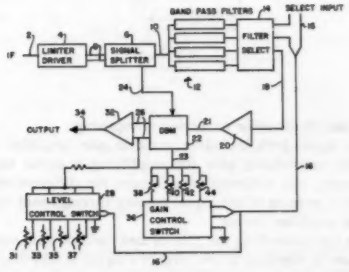
(c) said probe body (6) including an arm (7) having a free end and a pivot end, said arm (7) extending from the other end of said probe body along the axis of said bore and being pivotally articulated to said probe body at its pivot end so as to be movable about an axis parallel to the plane of said plate, said arm (7) having said two coils (8, 8') mounted at its free end, the centrifugal force produced by the rotational movement transmitted to said probe, and consequently to said arm (7), causing said free end of said arm (7) to move against the inner wall of a tube (4) inserted in said bore (2).

4,441,079

MULTIPLE BANDWIDTH FM DEMODULATOR

Donald J. Woodworth, Ocala, Fla., assignor to Microdyne Corporation, Ocala, Fla.

Filed Oct. 13, 1981, Ser. No. 311,111
Int. Cl.³ H03D *3/06*
U.S. Cl. 329—131 **7 Claims**



1. A selectable bandwidth detector for frequency modulated signals comprising,

a signal splitter for deriving a pair of signals from an input signal,

a double-balanced mixer,

a plurality of filters each having a different bandwidth from each other filter,

each said filter having a 90° phase shift therethrough at the carrier frequency of the frequency modulated signals and having a linear phase shift-frequency characteristic,

means for applying one of said pair of signals through a selected one of said filters to said double-balanced mixer,

means for applying the other of said pair of signals to said double-balanced mixer, and

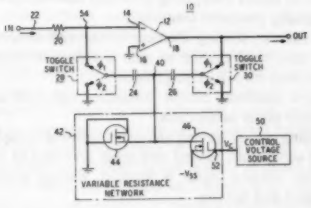
means for selecting the one of said filters to be inserted between said signal splitter and said double-balanced mixer.

4,441,080

AMPLIFIER WITH CONTROLLED GAIN

Veikko R. Saari, Spring Lake Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1981, Ser. No. 331,513
Int. Cl.³ H03G *3/20*
U.S. Cl. 330—86 **6 Claims**



1. A controlled gain amplifier of the type having a first operational amplifier with an inverting input port for receiving a signal from a signal source, a non-inverting input port, an output port, and a negative feedback network connected between one of said input ports and said output port, said feedback network changing its transconductance in response to a control voltage from a control voltage source, characterized in that said feedback network is a switched capacitor network comprising:

first and second capacitors connected in series between one of said input ports and said output port;

a first switch means responsive to a pair of non-overlapping pulse trains corresponding to first and second phase periods to connect one side of said first capacitor to said one input port of said first amplifier during said first phase period and to a reference potential during said second phase period;

a second switch means responsive to said pulse trains to connect one side of said second capacitor to said output port of said first amplifier during said first phase period and to a reference potential during said second phase period; and

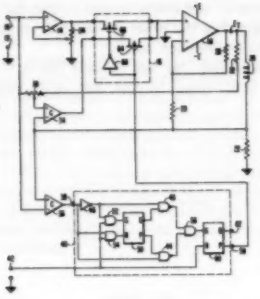
variable resistance means responsive to said control voltage and providing at least one current path from a common node of said first and second capacitors to a reference potential.

4,441,081

SWITCHING POWER DRIVING CIRCUIT ARRANGEMENT

Michael O. Jenkins, San Jose, Calif., assignor to International Business Machines, Armonk, N.Y.

Filed Dec. 22, 1981, Ser. No. 333,548
Int. Cl.³ H03F *1/34*
U.S. Cl. 330—110 **7 Claims**



1. A switching power driving circuit arrangement for driving a given load device in response to a driving control signal, comprising

an amplifying circuit arrangement having an input subcircuit, having an output subcircuit, and having two energizing potential terminals,

a source of direct energizing potential connected across said energizing potential terminals,

a load current sensing element connected in series circuit with said load device to said output subcircuit of said amplifying circuit arrangement,

a negative feedback circuit connected between said output and said input subcircuits,

a switching circuit having an output terminal coupled to said input subcircuit, having one input terminal to which said driving control signal is applied, having another input terminal and having

a control input terminal, a positive feedback circuit connected between said sensing device and said other terminal of said switching circuit,

circuitry connected to said switching circuit control input terminal for selectively applying said driving control signal to said input subcircuit and said positive feedback circuit thereto for overdriving said input subcircuit and effecting said output subcircuit to alternate between the limits of said direct energizing potential.

4,441,082

SWITCHED CAPACITOR AUTOMATIC GAIN CONTROL LOOP

Yusuf A. Haque, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Oct. 9, 1981, Ser. No. 310,160
Int. Cl.³ H03G *3/10*
U.S. Cl. 330—129 **13 Claims**

1. An automatic gain control circuit having an input terminal and an output terminal comprising:

amplifier means having an inverting input lead, a noninverting input lead connected to a reference voltage, and an output lead connected to said terminal output for providing an automatic gain control circuit output;

a first capacitor connected between said input terminal and said inverting input lead of said amplifier means;

means for controlling the gain of said automatic gain control circuit;

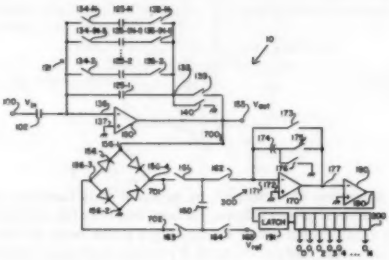
means for rectifying the output voltage of said automatic gain control circuit;

means for alternately integrating the rectified output voltage of said automatic gain control circuit and a reference voltage;

a digital counter operating in response to the output signal from said means for integrating;

a plurality of N capacitors, where N is a positive integer; and

a plurality of switch means for selectively connecting desired ones of said N capacitors in parallel between said inverting input lead and said output lead of said amplifier means;



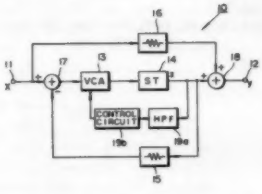
wherein said digital counter increases its count in response to an output signal of a first polarity from said integrator, and descreases its count in response to an output signal from said means for integrating of a second polarity opposite said first polarity from said integrator stage, and wherein the plurality of switch means is controlled by the count stored in said counter, and wherein the gain of said automatic gain control circuit is controlled by the ratio of the capacitance of said first capacitor to the capacitance of said selected ones of said plurality of capacitors.

4,441,083

NOISE REDUCTION CIRCUIT

Kenzo Akagiri; Masayuki Katakura, both of Yokohama, and Motomi Ookouchi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,387
Claims priority, application Japan, Sep. 9, 1980, 55-123967
Int. Cl.³ H03F *1/26;* H03G *3/18*
U.S. Cl. 330—149 **16 Claims**



1. A circuit for noise reduction comprising:

a first signal path including variable gain amplifier means with controllable gain for amplifying a signal supplied thereto, and differentiating means for differentiating at least a portion of the signal passing through said variable gain amplifier means;

means for controlling the gain of said variable gain amplifier means in response to the level of a signal in said first signal path;

first means connected with said first signal path for providing an upper limit to the gain imparted to a signal supplied to said circuit; and

second means connected with said first signal path for providing a lower limit to the gain imparted to said signal supplied to said circuit.

4,441,084

NOISE REDUCTION CIRCUIT

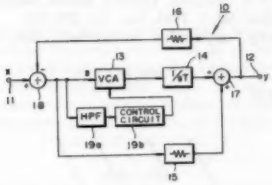
Kenzo Akagiri; Masayuki Katakura, both of Yokohama, and Motomi Ookouchi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,432

Claims priority, application Japan, Sep. 9, 1980, 55-123966

Int. Cl.³ H03F *1/26;* H03G *3/18*

U.S. Cl. 330—149 **16 Claims**



1. A circuit for noise reduction comprising:

a first signal path including variable gain amplifier means with controllable gain for amplifying a signal supplied thereto, and integrating means for integrating at least a portion of the signal passing through said variable gain amplifier means;

means for controlling the gain of said variable gain amplifier means in response to the level of a signal in said first signal path;

first means connected with said first signal path for providing a lower limit to the gain imparted by said variable gain amplifier means to a signal supplied to said circuit; and

second means connected with said first signal path for providing an upper limit to the gain imparted by said variable gain amplifier means to said signal supplied to said circuit.

4,441,085

SIGNAL AMPLIFYING APPARATUS

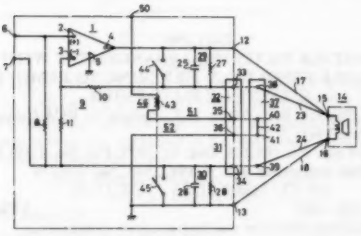
Hideto Sakamoto, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 293,840

Claims priority, application Japan, Aug. 20, 1980, 55-117616[U]

Int. Cl.³ H03F *1/34*

U.S. Cl. 330—293 **7 Claims**



1. In a signal amplifying apparatus which is provided with an amplifier, a feedback circuit having its input and output connected with the output and input of the amplifier, a first terminal connected with the output of the amplifier for connection with a first cord connected with the input of a load, and a second terminal connected with the input of the feedback circuit for connection with a second cord connected with the input of the load, the improvement comprising:

means for detecting whether the second cord is connected with the second terminal; and

means for coupling the output of the amplifier with the input of the feedback circuit by the detected output from the detecting means.

4,441,086

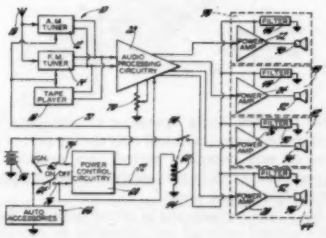
AUDIO SYSTEM WITH ORDERLY SHUTDOWN SEQUENCE

James P. Karlow, Noblesville, and Gary A. Hunt, Kokomo, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 13, 1982, Ser. No. 377,828

Int. Cl.³ H03F *1/26*

U.S. Cl. 330—297 **4 Claims**



1. An audio system including a source of direct current potential, a manually operable on/off switch, a source of audio signals, power amplifier means, audio processing circuit means connected between said source of audio signals and said power amplifier means, first controlled switching means for connecting said source of direct current potential to said power amplifier means in response to closure of said on/off switch, power control circuit means including second and third controlled switching means for connecting said source of direct current to said source of radio signals and said audio processing circuit means respectively in response to closure of said on/off switch, said power amplifier means including filter means which delay the shutdown of said power amplifier means for a first predetermined time interval following opening of said on/off switch, said third controlled switching means including time delay means for maintaining the connection between said source of direct current potential and said audio processing circuit means for a second predetermined time interval after the opening of said on/off switch, said second predetermined time interval being greater than said first predetermined time interval whereby said power amplifier means is deenergized prior to said audio processing circuit means to eliminate audible disturbances originating as a result of shutdown of said audio processing circuit means.

4,441,087

HIGH EFFICIENCY INVERTER & BALLAST CIRCUITS

Ole K. Nilssen, Caesar Dr. - Rte. 4, Barrington, Ill. 60010

Continuation of Ser. No. 973,741, Dec. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 890,586, Mar. 20, 1978, Pat. No. 4,184,128. This application Dec. 14, 1981, Ser. No. 330,599

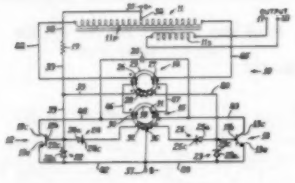
Int. Cl.³ H02M *7/53;* H03K *3/30*

U.S. Cl. 331—113 A **35 Claims**

26. For an inverter operable to produce a periodic AC voltage at an output from a DC voltage provided at an input, where said inverter comprises at least one semiconductor switch means with a control terminal, where a positive current provided to said control terminal tends to cause said switch means to conduct and a negative current provided to said

control terminal tends to cause said switch means to prevent conduction, where a complete period of said AC voltage is characterized by having four substantially different portions: a first portion of relatively low and substantially constant magnitude, a second portion of relatively rapidly increasing magnitude, a third portion of relatively high and substantially constant magnitude, and a fourth portion of relatively rapidly decreasing magnitude, and where said output is connected in circuit with an energy-storing inductor means, an improved drive circuit comprising:

first drive means connected in circuit between the output and the control terminal and operative to provide positive feedback from the output to the control terminal, said



positive feedback being operative to provide a positive current to the control terminal only during part of the first portion of said complete period, this positive current being terminated before the onset of the second portion of said complete period; and

second drive means connected in circuit between the output and the control terminal and operative to provide intermittent negative feedback from the output to the control terminal, said negative feedback being operative to provide only negative current to the control terminal, this negative current being provided immediately after the positive current has been terminated and lasting at least until the onset of the second portion of said complete period.

4,441,088

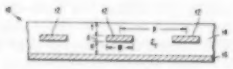
STRIPLINE CABLE WITH REDUCED CROSSTALK

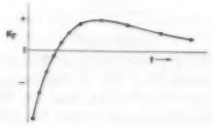
Carl J. Anderson, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,205

Int. Cl.³ H01P *3/08*

U.S. Cl. 333—1 **5 Claims**





1. A transmission line for carrying high speed signals with substantially reduced forward wave crosstalk, consisting essentially of a ground plane layer comprised of a plane of electrically conductive material;

a layer of dielectric material, having a single dielectric constant ϵ_r, located on said ground plane;

a plurality of signal carrying conductors located in said layer of dielectric and separated from said ground plane layer by a thickness of dielectric underlayer H, there being a thickness of said dielectric material above said plurality of conductors forming a dielectric overlayer of a thickness t, the thickness H being chosen to yield a transmission line having a desired impedance, and said thickness t of dielectric overlayer being chosen for the value of H such that the forward wave crosstalk components (mutual capacitance and mutla inductance) between adjacent signal carrying conductors are substantially equal and opposite.

4,441,089

CHANGE-OVER SWITCH FOR COAXIAL CONDUCTORS

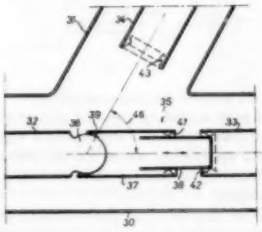
Gianni Olgiati, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 2, 1981, Ser. No. 279,755

Claims priority, application Switzerland, Jul. 15, 1980, 5402/80

Int. Cl.³ H01P *1/10*

U.S. Cl. 333—105 **5 Claims**



1. A change-over switch for high-power coaxial conductors, comprising:

a branched outer conductor; a plurality of inner conductors which end in the region of the branch; a connecting element, one end of said connecting element being articulated to one said plurality of inner conductors and the other end of said connecting element pivoting between the ends of others of said plurality of inner conductors; a first electrical contact between the one of said plurality of inner conductors and the articulated end of said connecting element, said first electrical contact having the form of a tulip-shaped contact; second electrical contacts associated with said others of said plurality of inner conductors and the pivotable end of said connecting element, said second electrical contacts having the form of tulip-shaped contacts, and wherein said connecting element for opening and closing said second electrical contacts further comprises an extendable telescopic tube.

4,441,090

CROSSTALK FILTERING ARRANGEMENT WITH VARIABLE FREQUENCY FILTERING TO REMOVE EFFECTS OF FM CARRIER

Henry R. Warren, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 105,111, Dec. 19, 1979, Pat. No. 4,335,394. This application Feb. 4, 1982, Ser. No. 345,914

Int. Cl.³ H03H *21/00, 15/02, 17/06*

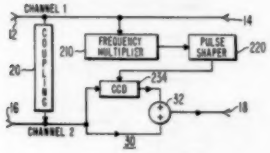
U.S. Cl. 333—165 **1 Claim**

1. A tracking filter for tracking a signal, comprising:

signal combining means including first and second input terminals and a signal output terminal;

controllable delay means including a signal input terminal coupled in parallel with said first input terminal of said signal combining means, a delayed signal terminal coupled to said second input terminal of said combining means and a clock input terminal for controlling the delay between

said signal input terminal and said delayed signal terminal of said controllable delay means so as to form a tracking filter the output terminal of which is said output terminal of said combining means; and



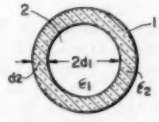
clock signal supply means continuously responsive to the instantaneous frequency of the signal to be tracked for supplying clock signals to said clock input terminal which continuously maintains the delay of said controllable delay means to be an integral multiple of one-half a cycle of the frequency of said signal to be tracked.

4,441,091

LOW LOSS LEAKAGE TRANSMISSION LINE

Shigeo Nishida; Mitsunobu Miyagi, both of Sendai, and Koichi Mikoshiba, Hitachi, all of Japan, assignors to Hitachi Cable Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 170,232, Jul. 18, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,818
Claims priority, application Japan, Jul. 18, 1979, 54-91822
Int. Cl.³ H01P *3/12*
U.S. Cl. 333—242 **5 Claims**



1. A low loss leakage transmission line comprising: a cylindrical dielectric tube having a wall thickness d_2 defined by:

$$d_2 \approx \sqrt{\frac{\epsilon_1}{\epsilon_2 - \epsilon_1}} \cdot \frac{n\lambda_0}{4},$$

where:

ϵ_1 is the dielectric constant of the space internal to the tube,

ϵ_2 is the dielectric constant of the tube,

λ_0 is the wavelength of the supported electromagnetic waves in free space, and

n is a positive odd integer.

4,441,092

VARIABLE INDUCTANCE WITH VARIABLE PICKOFF AND VARIABLE FLUX MEDIUM PERMEABILITY

Jack C. Thornton, Satellite Beach, Fla., and Randy G. Russell, Arlington Hts., Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 3, 1982, Ser. No. 373,946
Int. Cl.³ H01F *21/06*
U.S. Cl. 336—130 **11 Claims**

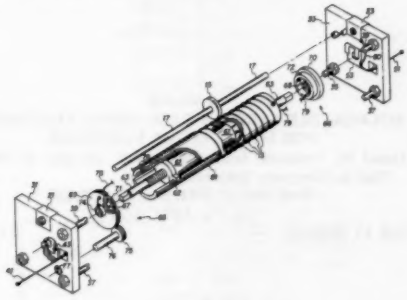
1. A variable inductor comprising:

a coil comprising multiple turns of electrical conductor, said coil having first and second coil ends;

a moveable contactor comprising conductive means for electrically contacting said coil and suitable for being moved to one or more selectable locations on the coil so as to provide electrical contact at the selected location on the coil, said moveable contactor establishing first and second coil portions, the first coil portion comprising the portion of the coil between the first coil end and said moveable contactor, and said second coil portion comprising the portion of the coil between said moveable contactor and said second coil end;

magnetic material having relative permeability greater than the relative permeability of air, said material being located proximate said coil and being moveable;

means for causing said magnetic material to move simultaneously with location selection movement of said moveable contactor such that for each selected location of the contactor there is automatically effected a coordinated location of the magnetic material, the locations of contactor and material being coordinated so as to cause the first coil portion to have a substantially greater inductance than it would have were the magnetic material not proximate the coil, while permitting the second coil portion to have an inductance not substantially different from what it would have were the magnetic material not proximate the coil.

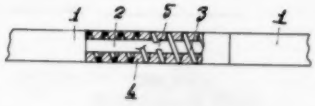


4,441,093

THERMAL FUSE AND THE METHOD OF MANUFACTURING THE SAME

Tasuku Okazaki, 535-81, Nishi 3-chome, Nakayama-cho, Nara City, Nara Prefecture, Japan

Filed Apr. 8, 1982, Ser. No. 366,674
Claims priority, application Japan, Apr. 28, 1981, 56-64420; Feb. 9, 1982, 57-20567
Int. Cl.³ H01H *37/76*
U.S. Cl. 337—404 **8 Claims**



1. A thermal fuse comprising:

two wire-shaped conductors formed of electrically conductive metal material, said two conductors being axially aligned with respective confronting end surfaces being spaced and defining therebetween a space;

a coiled spring having opposite ends fixed to respective confronting ends of said two conductors with said spring being under tension within said space;

a rod member of heat resistant and electrically insulating material positioned within said coiled spring and extending between said end surfaces of said two conductors;

said spring and said rod member being embedded in a solid fusible metal alloy material which has the property of melting at a predetermined temperature, said solid metal

alloy material extending between said two conductors and thereby forming a current path therebetween; and

said spring being cut, thereby defining two spring portions held in a tensioned condition by said solid fusible metal alloy material, whereby upon reaching said predetermined temperature said metal alloy material melts, thereby releasing said spring portions from said tensioned condition, such that said spring portions contract and instantaneously separate said metal alloy material and interrupt said current path.

4,441,094

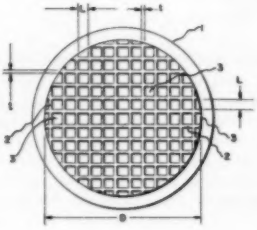
SOLDERABLE LARGELY BASE METAL ELECTRODES FOR METAL OXIDE VARISTORS

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,246

Int. Cl.³ H01C *7/12*

U.S. Cl. 338—21 **5 Claims**



1. A metal oxide varistor having electrodes attached to at least one major surface thereof, comprising:

at least one base metal electrode bonded to said metal oxide varistor and forming therewith an electrically conductive contact; and

a distributed noble metal pattern disposed on said base metal electrode and forming an electrically conductive contact with said base metal electrode, said noble metal pattern covering a selected fraction of said base metal electrode whereby is formed a multi-layered low resistivity contact.

4,441,095

CODE TRANSLATOR

Walter R. Widmer, Niederhasli, and Marcel Baschong, Staufen, both of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

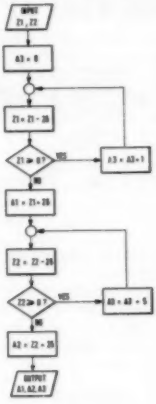
Filed Dec. 8, 1978, Ser. No. 967,580

Claims priority, application Switzerland, Dec. 16, 1977, 15514/77

Int. Cl.³ G06F *3/00*

U.S. Cl. 340—347 DD **14 Claims**

1. A crypto-converter for unambiguously converting characters of a first 128-character alphabet into characters of a second 26-character alphabet and vice-versa, comprising a conversion stage and a reconversion stage; the conversion stage including input means for a pair of characters of said first alphabet, means converting said pair of characters into three characters of said second alphabet and output means for said three characters; and the reconversion stage including input means for a triple of characters of said second alphabet, means reconverting said triple of characters into a pair of characters



of said first alphabet and output means for said pair of characters.

4,441,096

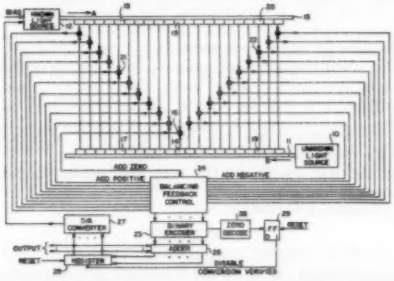
OPTICAL ANALOG-TO-DIGITAL CONVERTER

Vincent L. Evanchuk, Sherman Oaks, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 161,934, Jun. 23, 1980, abandoned. This application Aug. 13, 1982, Ser. No. 407,830

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **8 Claims**

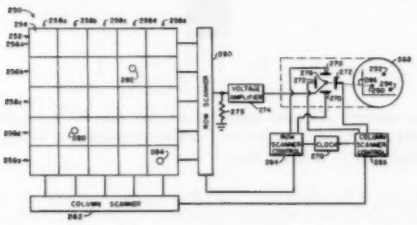


1. A method for analog-to-digital conversion of an unknown optical signal into an electrical signal in digital form by comparison with a known optical signal comprising the steps of transmitting the known and unknown optical signals separately through two displaced and parallel light paths of substantially equal attenuation per unit length, independently detecting the intensity of light along said two light attenuating paths to determine the points along said two light attenuating paths at which the light intensity in the path for said unknown optical signal is substantially equal to the known signal along said path for said known signal, and producing an output signal in digital form representative of the position of the point where said unknown signal is equal to said known light signal.

4,441,097
DEVICE FOR CONTROLLING A CIRCUIT

Gary B. Anderson, Tahoe City, Calif., assignor to Antroy Enterprises, Inc., San Francisco, Calif.

Division of Ser. No. 7,411, Jan. 29, 1979. This application Nov. 20, 1981, Ser. No. 323,267
Int. Cl.[3] G08C 9/00
U.S. Cl. 340—365 A 7 Claims



1. A pressure detecting device comprising

a thin resiliently deformable sheet of semiconductor material having an internal electrical conductivity generally invariable according to applied pressure, the surface of said semiconductor having microscopic ridges and depressions therein,

a first electrode connected to said circuit comprising a flexible sheet of electrically conductive metal foil, selected from the group consisting of copper, steel and aluminum and alloys thereof, in mechanical contact with one side of said resiliently deformable semiconductor sheet material and electrically connected to said circuit,

a second electrode connected to said circuit comprising a flexible sheet of electrically conductive metal foil, selected from the group consisting of copper, steel, and aluminum and alloys thereof, in mechanical contact with the other side of said resiliently deformable semiconductor sheet material and electrically connected to said circuit, and

said circuit being responsive to deformation of said microscopic ridges and depressions in the presence of applied pressure on said first electrode, resiliently deformable semiconductor sheet and second electrode combination for providing an output signal that is a function of applied pressure.

4,441,098
MULTIPOSITION SWITCH WITH MINIMUM INTERCONNECTIONS

Jaime A. Borras, Hialeah, and Ruben J. Gonzalez, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1981, Ser. No. 251,640
Int. Cl.[3] G08C 9/08
U.S. Cl. 340—365 R 7 Claims

5. An interface system for providing a minimum number of interconnections between a circuit and a multiposition switch, said switch having a selector terminal and a plurality of switch positions, comprising:

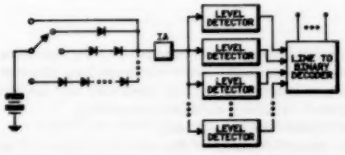
signal source means coupled to said selector terminal for supplying an electrical signal thereto;

one interconnecting line coupled to said circuit;

a plurality of unique electrical circuits each having a first and a second circuit node, each of said first circuit nodes coupled to an unique one of said switch positions and each of said second circuit nodes coupled to said interconnecting line, each of said electrical circuits including an unique number of substantially identical electrical components arranged to provide a unique signal level at said interconnecting line for each of said switch positions; and

signal level detection means, coupled to said interconnecting line, for identifying which of said unique signal levels is present on said interconnecting line;

whereby the electrical signal applied by said signal source means is monitored by said signal level detection means to determine which of said plurality of electrical circuits is

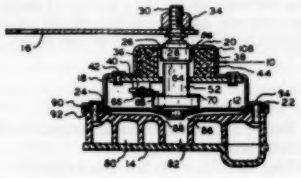


connected through the one interconnecting line and thereby determine which position of said multiposition switch has been selected.

4,441,099
DIAPHRAGM HORN

James A. Neese, Flora, Ill., assignor to Sparton Corporation, Jackson, Mich.

Division of Ser. No. 236,662, Feb. 23, 1981, Pat. No. 4,361,952. This application Sep. 7, 1982, Ser. No. 414,651
Int. Cl.[3] G08B 3/10
U.S. Cl. 340—388 5 Claims

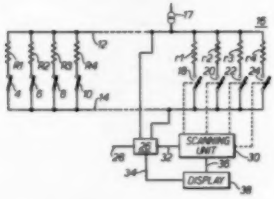


1. An electric horn comprising, in combination, a closed housing having a projector sealingly mounted thereon, a diaphragm mounted on said housing intermediate said housing and projector, said projector having a passage communicating with said diaphragm and the atmosphere, motor means within said housing adapted to vibrate said diaphragm, and vent means extending through said diaphragm venting said housing to the atmosphere through said projector passage.

4,441,100
ELECTRICAL CIRCUITS

John L. Galloway, Edinburgh, Scotland, assignor to Racal Security Limited, Newbridge, Scotland

Filed Jan. 6, 1982, Ser. No. 337,433
Claims priority, application United Kingdom, Jan. 6, 1981, 8100217
Int. Cl.³ G08B 26/00
U.S. Cl. 340—518 18 Claims



1. A circuit arrangement responsive to the operation of one of a plurality of normally inoperated switching elements which each have an inoperated and operated state and for identifying the operated switching element, comprising

a plurality of first impedances,

means connecting each of the switching elements in combination with a respective one of the first impedances,

means connecting the combinations in parallel with each other to form a first circuit bank,

the first impedances having predetermined and respectively different impedance values so that operation of any one of the switching elements changes the total impedance of the first circuit bank by a respective and predetermined amount,

a plurality of testing elements,

a plurality of normally inoperated test switch means each having an inoperated and an operated state,

means connecting each testing element in combination with a respective one of the first switch means, these combinations being connected in parallel with each other to form a second circuit bank,

monitoring means connected to compare the first and second circuit banks whereby to detect the change in impedance of the first circuit bank from a datum value and resulting from operation of one of the switching elements and responsive thereto to operate the test switch means in a predetermined sequence until the impedance of the first circuit bank is returned to the datum value,

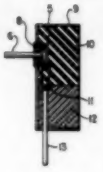
the said testing elements being of such nature and having such respective electrical parameters that, when the impedance across the first circuit bank is returned to the said datum value, the identity of the operated one of the switching elements within the plurality of switching elements corresponds to the identity of the operated test switch means within the plurality of test switch means.

4,441,101
GRAIN SENSOR

James D. J. Robar, Saskatoon, Canada, assignor to SED Systems Inc., Saskatoon, Canada

Filed Oct. 22, 1981, Ser. No. 313,565
Claims priority, application Canada, Nov. 7, 1980, 346228
Int. Cl.³ G01F 1/05
U.S. Cl. 340—606 16 Claims

1. A grain sensor comprising a thin piezoelectric crystal having a pair of opposite faces, a pair of output wires connected to said faces, a pin fixed orthogonally to a central region of one of the faces, a housing including a front wall having a hole therethrough, a resilient grommet held in the hole in said wall, the pin passing through said grommet in peripheral and resilient contact therewith, said crystal being disposed within the housing, flexible adhesive material disposed between said one face of the crystal and the grommet, and closed cell resil-

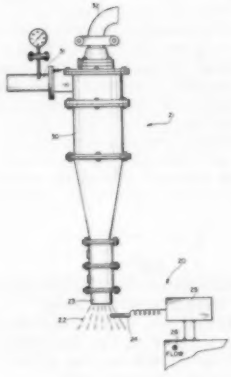


ient material disposed against the other face of the crystal within the housing, said closed cell resilient material acting as a high pass mechanical filter.

4,441,102
FLOW SENSING APPARATUS

Charles E. Webb, Canada, Ky., assignor to Basic American Industries, Indianapolis, Ind.

Filed Jan. 2, 1981, Ser. No. 222,121
Int. Cl.³ G08B 21/00
U.S. Cl. 340—673 9 Claims



1. A flow sensing apparatus for providing an indication of the presence of an irregularly flowing stream from an outlet, said flow sensing apparatus comprising:

an electrical contact probe member disposed in said stream;

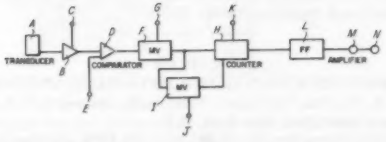
a sensing circuit cooperatively arranged with said probe member and adapted to rapidly provide a sequence of two different signals, a first signal being generated by said sensing circuit when the stream makes contact with said probe member, and a second signal being generated by said sensing circuit when said stream does not make contact with said probe member; and

a display light cooperatively arranged with said sensing circuit for indicating the presence of said irregularly flowing stream, said display light switching on in response to one of said first or second signals, and said display light switching off in response to the other of said signals so as to produce a flickering light indicating the dynamic conditions of said irregularly flowing stream.

4,441,103
UNUSUAL VIBRATION TRANSDUCER APPARATUS IN MACHINE TOOLS

Hirokuni Urabe, Fukuyama, Japan, assignor to Shigiya-Machinery Works Ltd., Japan

Filed May 26, 1981, Ser. No. 266,763
Int. Cl.³ G08B 21/00
U.S. Cl. 340—680 **4 Claims**

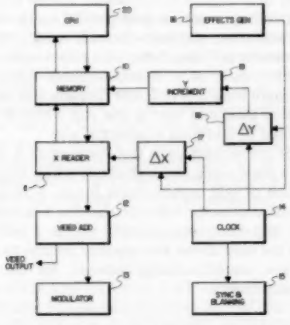


1. A detection apparatus for gap elimination of a grinding machine tool having a vibration transducer which comprises:
(a) a vibration sensor mounted on said grinding machine,
(b) an amplifier to amplify the output signal from said vibration sensor,
(c) a comparator to compare the output signals from said amplifier with a preset value to provide high-and-low output values,
(d) a first monostable multivibrator set by said high-and-low output signal and reset in a certain defined time,
(e) a second monostable multivibrator set by the output from said first monostable multivibrator and reset in a certain defined time to output a reset signal, and
(f) a preset counter to count the output of said first monostable multivibrator to output pulses when reaching the predetermined preset count and set by the reset signal from said second monostable multivibrator, whereby the rapid infeed rate of a tool is changed to optimum feed when a pulse is generated from said preset counter by vibrations during tool operation.

4,441,104
GRAPHIC EFFECTS GENERATOR

Harold T. Finney, II, Temple City, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 31, 1981, Ser. No. 336,210
Int. Cl.³ G09G 1/00
U.S. Cl. 340—724 **4 Claims**

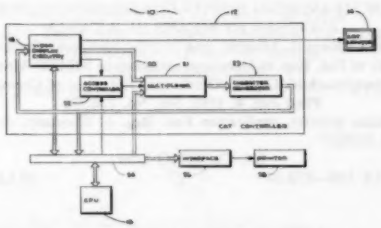


1. A graphic effects generator for use in a computer controlled raster scan display system comprising:
clock means providing raster scan reference signals;
display means coupled to said clock means and including an image forming surface and means for raster scan of said image forming surface in two directions responsive to said clock means;
a memory organized in a plurality of elements each corresponding to regions of said image forming surface and having therein stored information defining an image to be displayed;
reading means for reading said stored information from said memory and converting said stored information to a displayable image signal corresponding to said image;
timing means including start number generating means producing a start number for timing the operation of said reading means with respect to said display means to position said image upon said image forming surface and including scroll means coupled to said clock means introducing a delay of raster scan reference which varies as a function of said start number; and
displacement means operative upon said scroll means for abruptly altering the operation of said timing means by applying randomly varying start numbers to said scroll means to cause erratic shifts of said image with respect to said image forming surface.

4,441,105
DISPLAY SYSTEM AND METHOD

James G. Van Vliet, La Habra, and Frank M. Aralis, Fountain Valley, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 28, 1981, Ser. No. 335,010
Int. Cl.³ G09G 1/24
U.S. Cl. 340—750 **10 Claims**



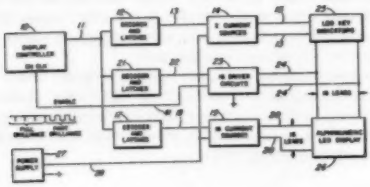
1. A video display system adapted to provide control signals to display means and printer means wherein the display means is for providing visual representations of a plurality of picture elements arranged in a matrix and the printer means is for printing a plurality of picture elements arranged in a matrix, and where charcters to be displayed are formed by a cell of picture elements, the system comprising:
character generator means responsive to coded signals for providing a plurality of output bits corresponding to a predetermined portion of the cell of picture elements;
selector means for selecting between first and second coded signals to provide one of the first or second coded signals to the character generator means;
video controller means for generating the first coded signals and for responding to the character generator means output bits when the first coded signals are applied to the character generator means to generate the control signal for the display means including the output bits;
printer controller means for generating the second coded signals and for responding to the character generator means output bits when the second coded signals are applied to the character generator means to generate the control signal for the printer means, the control signal including the output bits; and
timing means for controlling the selector means.

4,441,106

ELECTRICAL DISPLAY APPARATUS WITH REDUCED PEAK POWER CONSUMPTION

Prentiss W. Jackson, Livermore, Calif., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 4, 1982, Ser. No. 384,930
Int. Cl.³ G09G 3/14
U.S. Cl. 340—811 6 Claims



6. A method of operating a display apparatus in which illuminating current pulses of a predetermined duration are periodically directed to selected ones of light emitting devices (LEDs), the method being characterized by the steps of :

(a) determining an operating condition wherein an average operating current requirement for the selected ones of the LEDs would normally exceed a predetermined limit; and

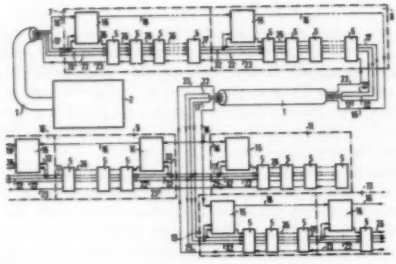
(b) reducing said predetermined duration of the current pulses to a lesser duration, to prevent the average operating current requirement from exceeding the predetermined limit.

4,441,107

MEASURING ARRANGEMENT HAVING A PLURALITY OF MEASURING POINTS CONNECTED TO ONE ANOTHER BY MEANS OF A CABLE

Heiko Chaborski, Munich, and Walter Mehnert, Ottobrunn, both of Fed. Rep. of Germany, assignors to MITEC Moderne Industrietechnik GmbH, Ottobrunn, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,391
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025837
Int. Cl.³ H04Q 5/00
U.S. Cl. 340—870.16 30 Claims



1. In an arrangement for measuring variable ambient physical parameters having a plurality of measuring stations connected by means of a multiwire cable to one another and to a remote control and measuring centre, each of said measuring stations comprising at least one sensor (20) which changes its electric resistance dependent on the physical ambient parameter, at least one switch arrangement (21) which in its closed state connects the sensor via a first wire (22) of the cable to a common energy source from and via a second wire (23) back to the control and measuring centre (2), and a control circuit (25, 45) which closes the switch arrangement (21) for a short period for each measuring operation and then opens it, said stations being arranged along said cable in a plurality of sections (7–13), each section being provided with a selectable circuit (15) independently activated over a third wire (16) by the control and measuring centre (2), said control circuits (25) of each of said measuring stations within each cable section being triggered by said control and measuring centre sequentially one after another for closing the corresponding switch means (21) only after activation of the corresponding selectable circuit (15), by means of a clock signal commonly transferred by a fourth wire (17) to all measuring stations from the control and measuring centre (2).

4,441,108

OMNIDIRECTIONAL MULTIPLE-BAND ANTENNA

Jan L. Ten Pas, The Hague, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 21,863, Mar. 19, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,711
Claims priority, application Netherlands, Mar. 22, 1978, 7803099
Int. Cl.³ H01Q 5/00, 21/06
U.S. Cl. 343—857 8 Claims

1. An omnidirectional multiple-band antenna for use with a plurality of simultaneously operating transceivers, said multiple-band antenna comprising

a central mast conductor,

a plurality of elongated stub-elements spaced from said mast and extending in a direction parallel to the longitudinal axis of said mast, said stub-elements being arranged about the perimeter and distributed along the length of said mast conductor, each of said stub-elements being a quarter-wavelength long at a different frequency in an associated frequency band and having one end which is electrically connected to said mast conductor, and

means for connecting each stub-element to a transmission line at a point along said stub-element near said one end so that each of said stub-elements forms, with a portion of said mast conductor opposite thereto, a parallel resonant circuit that electromagnetically excites a half-wave portion of the mast above the opposite portion to radiate as a half-wave omnidirectional antenna for the respective frequency band.

4,441,109

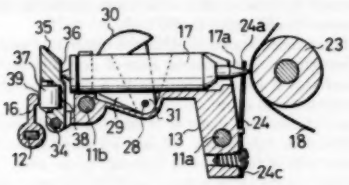
PEN TYPE RECORDING DEVICE

Kyuichi Fujisawa, Tonan, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 348,145
Claims priority, application Japan, Feb. 17, 1981, 56-20090[U]
Int. Cl.³ G01D 15/16; B41J 29/26
U.S. Cl. 346—139 R 15 Claims

1. A pen type recording device for performing recording by relative movements of pen means and recording paper in the

state where the tip end of the pen means is brought into contact with the recording paper, comprising a pen holding member for holding the pen means in such a manner that the pen means



can project toward the recording paper, and a rotary lift member rotatably supported on said pen holding member to lift up the rear side of the pen means held on said pen holding member by the rotation thereof.

4,441,110

PRINTING HEAD PROTECTING DEVICE IN INK JET PRINTER

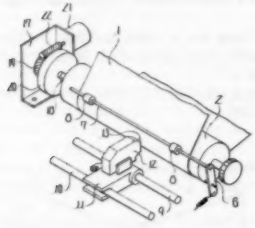
Siro Hatakeyama, Tokyo; Harutaro Oba, and Yoshitaka Ukai, both of Shizuoka, all of Japan, assignors to Tokyo Electric Co., Ltd. and Konishiroku Photo Industry Co., Ltd., both of Tokyo, Japan

Filed May 28, 1982, Ser. No. 383,274

Claims priority, application Japan, Jun. 4, 1981, 56-86136; Jun. 4, 1981, 56-86137; Jun. 4, 1981, 56-86138

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **9 Claims**



1. A printing head protecting device in an ink jet printer having a platen for guiding a printing paper and a reciprocable carriage which carries thereon a printing head along the platen, said printing head protecting device comprising an ink receiving member for cleaning positioned so as to project a little more than the surface of said platen, a protective member positioned at least on said ink receiving member side of said printing head and projecting toward said platen, and a parting member for moving said protective member in a direction away from said platen before said printing head is opposed to said ink receiving member through its movement along said platen.

4,441,111

METHOD AND APPARATUS FOR APPLYING SIGNAL VOLTAGES TO ELECTROSTATIC RECORDING MULTI-STYLUS ELECTRODE ASSEMBLY

Toshihiko Toyoshima, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,901

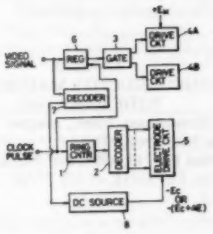
Claims priority, application Japan, Apr. 14, 1981, 56-55061

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—154 **6 Claims**

4. An apparatus for applying signal voltages to an electrostatic recording multi-stylus electrode device of a type having a multi-stylus electrode assembly of a same-plane control type or a back-plane control type composed of main electrodes an control electrodes, circuit means for driving said main electrodes, and circuit means for driving said control electrodes with a voltage provided by a DC source, the improvement comprising:

decoding means receiving an input video signal, said decoder means producing an output signal indicative of the presence or absence of a discontinuous "black" bit signal in said video signal; and



a DC source for outputting a normal voltage applied to said control electrodes in response to an output signal from said decoder being in a logic state indicative of continuous "black" signals or the absence of "black" signals in said video signal and a control voltage higher than said normal control voltage when said output signal from said decoder means indicates the presence of a continuous "black" signal in said video signal.

4,441,112

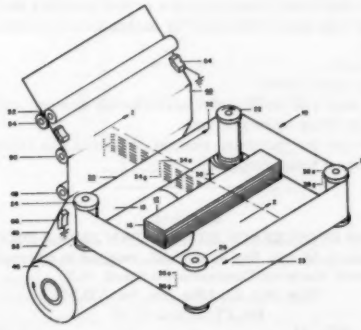
NON-IMPACT DOT MATRIX PRINTER

Michael I. Keller, 1935 Hawthorne, Alexandria, Va. 22311

Filed Mar. 5, 1982, Ser. No. 355,026

Int. Cl.³ G01D *15/08*

U.S. Cl. 346—163 **5 Claims**



1. A non-impact dot matrix printer, for recording complete alpha-numeric characters sequentially one at a time on a recording medium having an electrical conductive erosive surface, comprising

a laminar stack of a plurality of electrical conductors having edges that define a planar surface, and each conductor being separated from the other by an electrical insulator,

a dielectric endless belt having opposite surfaces and formed with a plurality of similar holes disposed transversely and linearly between the edges of said belt,

means to rotate said belt with one of its surfaces directly adjacent but spaced from said planar surface of said electrodes and each of said holes aligned with a separate edge of said conductors, respectively,

means to dispose said conductive surface of said recording medium directly adjacent but spaced from the other of said surfaces of said belt, and

means including said conductive surface as an electrode to provide electric spark discharges between selected conductors of said stack and said conductive surface of said recording medium, through selected holes of said belt, in accordance with signals applied to said conductors through control circuitry whereby to erode said conductive surface selectively and to provide said complete alpha-numeric characters sequentially.

4,441,113

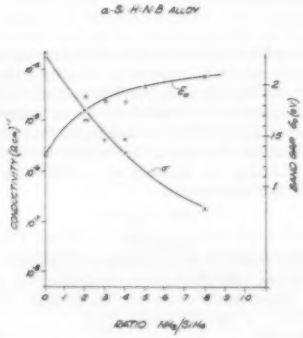
P-TYPE SEMICONDUCTOR MATERIAL HAVING A WIDE BAND GAP

Arun Madan, Birmingham, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Feb. 13, 1981, Ser. No. 234,287

Int. Cl.³ H01L *45/00, 27/14, 27/12*

U.S. Cl. 357—2 **19 Claims**



4. An improved photoresponsive device including an amorphous p-type semiconductor alloy having a composition comprising:

a. silicon;

b. a p-type dopant;

c. at least one density of states reducing element, said element being hydrogen; and

d. a band gap increasing element, said band gap increasing element being nitrogen.

4,441,114

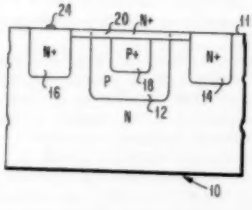
CMOS SUBSURFACE BREAKDOWN ZENER DIODE

Raymond A. Muggli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1981, Ser. No. 333,547

Int. Cl.³ H01L *29/90*

U.S. Cl. 357—13 **6 Claims**



1. A subsurface breakdown zener diode in a complimentary metal oxide semiconductor integrated circuit structure comprising,

a semiconductor body of the first conductivity type material,

a diffused region of a second conductivity type material formed from the surface of said semiconductor body to a predetermined depth in said body,

a diffused anode region of enhanced material of said second conductivity type material formed centrally in said diffused region from the surface to a depth less than said predetermined depth,

regions of enhanced material of said first conductivity type diffused in the surface of said semiconductor body at either side of the first said diffused region, and

a further region comprising a layer of the same enhanced material of said first conductivity type diffused over said diffused anode region and constituting a cathode region and interconnecting said regions of enhanced material of said first conductivity type.

4,441,115

THYRISTOR HAVING A CENTER PN JUNCTION FORMED BY PLASTIC DEFORMATION OF THE CRYSTAL LATTICE

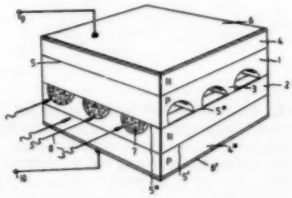
Reinhard Dahlberg, Flein, Fed. Rep. of Germany, assignor to Higratherm Electric GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,106

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926734

Int. Cl.³ H01L *29/06, 27/14, 29/74*

U.S. Cl. 357—38 **11 Claims**

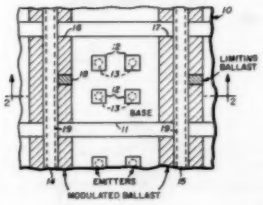


1. A thyristor having a pn junction produced by plastic deformation of the crystal lattice comprising in combination: a first monocrystalline semiconductor disc of one conductivity type having a region of the opposite conductivity type on one major surface; a second monocrystalline semiconductor disc of said opposite conductivity type having a region of said first conductivity type on one major surface; a means for electrically contacting said one major surface of each said disc; a structure with parallel ridges with walls and with spaces therebetween formed in the opposite major surface of each of said first and second semiconductor discs; and said first and second semiconductor discs, assembled with their said structured opposite major surfaces facing and with said ridges intersecting and contacting one another, form a plurality of parallelly connected pn junctions due to plastic deformation of the semiconductor lattice at the areas of contact, and a sequence of four semiconductor regions of alternating opposite conductivity type.

4,441,116
CONTROLLING SECONDARY BREAKDOWN IN BIPOLAR POWER TRANSISTORS

Robert J. Widlar, Jalesco, Mexico, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 13, 1981, Ser. No. 282,490
Int. Cl.³ H01L 27/02, 29/72
U.S. Cl. 357—43 2 Claims



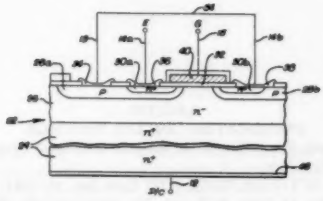
1. A power transistor cell comprising:
a semiconductor substrate of one conductivity type having an upper surface and a resistivity suitable for a transistor collector function;
a base region of opposite conductivity type extending from said surface into said substrate, said base region having a closed periphery defined at said surface;
at least one emitter region of said one conductivity type located within said base region periphery and extending part way through said base region;
a base contact region of said opposite conductivity type extending from said surface into said substrate spaced apart from and parallel to said base region over at least a portion of said periphery;
a first resistor region of said opposite conductivity type spanning the space between said base region and said base contact region and extending into said surface of said substrate so as to form a pn junction with said substrate whereby said first resistor is variable in response to the voltage on the collector of said cell, the resistivity of said first resistor region being selected to produce a pinch off voltage below that of the collector to base voltage breakdown of said cell;
a second resistor region confined to within a relatively small portion of said first resistor region, said second resistor region being more heavily doped than said first resistor region so as to have a pinch off voltage above that of said collector to base voltage breakdown of said cell; and
means for making electrical contact with said emitter region, said base contact region and said substrate.

4,441,117
MONOLITHICALLY MERGED FIELD EFFECT TRANSISTOR AND BIPOLAR JUNCTION TRANSISTOR

Nathan Zommer, San Jose, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Jul. 27, 1981, Ser. No. 287,497
Int. Cl.³ H01L 27/02
U.S. Cl. 357—43 4 Claims

1. A monolithically merged field-effect transistor and bipolar junction transistor device comprising:
a first semiconductor region of a first conductivity type;
a second semiconductor region of said first conductivity type;
a third semiconductor region of a second conductivity type opposite to that of said first and second regions, said third region being disposed between said first and second regions;
a fourth semiconductor region of said first conductivity type;
a fifth semiconductor region of said second conductivity type disposed between said fourth region and said first region;
a base contact electrically connected to said third region;
a gate electrode insulatively coupled to said third and fifth regions;
an electrical connection connecting said fourth and third regions;

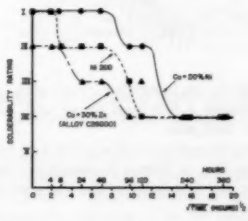


wherein said first region is a monolithically merged drain and collector, said second region is a monolithically merged source and emitter, said third region is a monolithically merged channel region and base, said fourth region is a second source and said fifth region is a second channel region, and wherein a signal applied to said gate electrode causes said device to function as a Darlington-connected field effect transistor and bipolar junction transistor pair.

4,441,118
COMPOSITE COPPER NICKEL ALLOYS WITH IMPROVED SOLDERABILITY SHELF LIFE

Julius C. Fister, Hamden, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 13, 1983, Ser. No. 457,606
Int. Cl.³ H01L 23/48, 29/46, 29/54, 29/62
U.S. Cl. 357—70 15 Claims



1. A composite structure having a reduced growth of copper-tin intermetallic compounds, said composite structure comprising:
a substrate formed from a copper base alloy;
said copper base alloy consisting essentially of 19% to about 28% nickel and the balance essentially copper;
a coating covering at least a portion of said substrate;
said coating being formed from a tin-containing material; and
said nickel in said alloy retarding the growth of said copper-tin intermetallic compounds and diffusion of said copper through said coating and thereby improving the solderability shelf life and contact resistance of said structure.

8. An integrated circuit assembly for electrical applications, said assembly comprising:
a lead frame formed from a composite structure;
said composite structure having a substrate formed from a copper alloy consisting essentially of 19% to about 28% nickel and the balance essentially copper and a coating covering at least a portion of said substrate;

said coating being formed from a tin-containing material; and

said nickel in said alloy retarding the growth of copper-tin intermetallic compounds and diffusion of said copper through said coating.

4,441,119

INTEGRATED CIRCUIT PACKAGE

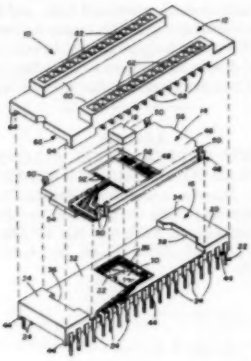
Joseph Link, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US81/00059, § 371 Date Jan. 15, 1981, § 102(e) Date Jan. 15, 1981, PCT Pub. No. WO82/02458, PCT Pub. Date Jul. 22, 1982

PCT Filed Jan. 15, 1981, Ser. No. 273,848

Int. Cl.³ H01L *23/02, 39/02;* H02G *13/08*

U.S. Cl. 357—74 **18 Claims**



17. A package for an integrated circuit chip, comprising:

structure defining a first lead frame with plural bonding fingers and lead pins;

a first member formed around said first lead frame such that the bonding fingers thereof terminate internally within an opening in said first member and the lead pins terminate externally thereof;

structure defining a second lead frame with plural bonding fingers and corresponding contacts;

a second member formed around said second lead frame such that the bonding fingers thereof terminate internally within an opening in said second member and the contacts terminate externally thereof;

said first and second members being secured together such that the openings therein cooperate to define a cavity for receiving the integrated circuit chip;

means secured within the opening in said first member for closing one end of the cavity and providing a base for the integrated circuit chip;

the lead pins on the first lead frame extending downward from the first member with the contacts of said second lead frame extending upward from the second member; and

a third member interconnected with said second member, said third member including predetermined openings therein adapted for receiving the upward contacts of said second lead frame and cooperating therewith to define plural integrated socket connections.

4,441,120

DEVICE FOR MEASURING AND METHODS FOR ADJUSTING THE CONVERGENCE OF THE ELECTRON BEAMS IN COLOR DISPLAY TUBES

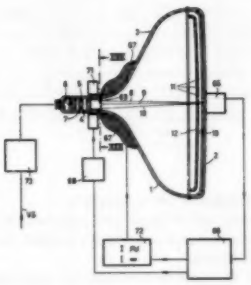
Jan Gerritsen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,515

Claims priority, application Netherlands, May 3, 1979, 7903468

Int. Cl.³ H04N *9/62*

U.S. Cl. 358—10 **10 Claims**



1. In a color display system having a color display tube for forming a color image from three controllable electron beams on a display screen, said beams having a convergence control for positioning said beams to converge at a desired position, a device for determining the proper convergence of said beams comprising:

a light detector including a photosensitive cell for receiving light from said color display tube having at least two separate photosensitive surface parts symmetrical about a center line of said detector, the photosensitivity of said surface parts increasing substantially as the distance from said center line, and optical elements for coupling a portion of a displayed image from said color display tube to said photosensitive surface parts; and

means for measuring the difference in light intensity on each of said photosensitive parts whereby the convergence controls for said beams can be adjusted to establish a zero difference in light intensity from said detector surfaces to establish a convergence condition.

4,441,121

ADJUSTABLE CORING CIRCUIT

Leopold A. Harwood, Bridgewater, N.J., and Robert L. Shanley, II, Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 363,868, Mar. 31, 1982, abandoned. This application Jan. 25, 1983, Ser. No. 460,985

Int. Cl.³ H04N *9/535, 5/14*

U.S. Cl. 358—36 **4 Claims**

1. A system for effecting an adjustable amount of coring of signals derived from a source comprising:

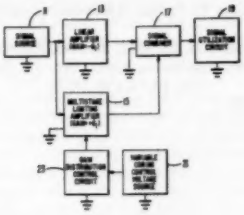
first signal translating means, having an input coupled to said source, for linearly translating said signals;

second signal translating means, having an input coupled to said source, for non-linearly translating said signals; said second signal translating means comprising a multistage limiting amplifier for developing a limited version of said signals, said limiting amplifier including first and second signal amplifying stages coupled in cascade, and exhibiting an overall gain substantially equal to the gain exhibited by said first signal translating means;

means, responsive to the outputs of said first and second signal translating means, for developing a cored version of said signals corresponding to the difference between a linearly

translated version of said signals and a limited version of said signals; and

means, coupled to said first and second signal amplifying



stages, for selectively altering the distribution of gain between said first and second signal amplifying stages substantially without disturbance of said overall gain of said limiting amplifier.

4,441,122

BEAM CURRENT CONTROL FOR TELEVISION CAMERA

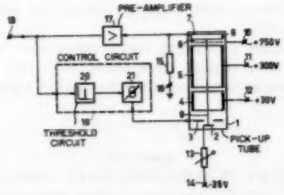
Louis M. Swart, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 18, 1982, Ser. No. 340,164

Claims priority, application Netherlands, Feb. 9, 1981, 8100600

Int. Cl.³ H04N *5/34*

U.S. Cl. 358—41 **3 Claims**



1. A television camera comprising a control circuit for controlling the electron beam current intensity in at least one pick-up tube of said camera, the pick-up tube comprising a current-controlled electron gun having at least a cathode connected to a voltage terminal and a control electrode, the control circuit having a controllable current source an output of which is connected to the control electrode and a control input of which is coupled to a pick-up tube output for producing a picture signal, wherein an electrostatic focussing means is employed at the pick-up tube and the cathode of the electron gun is connected to the voltage terminal via a resistor.

4,441,123

PHOTOSENSOR PATTERN OF SOLID-STATE IMAGING SENSORS

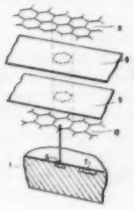
Shigeharu Ochi, San Jose, Calif., assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1981, Ser. No. 307,146

Int. Cl.³ H04N *9/07*

U.S. Cl. 358—44 **8 Claims**

1. A solid-state color imager of the type having an array of solid-state pixels arranged in columns and rows and each adapted to produce an electrical signal representing light intensity, said pixels being of the type having the light sensitive part separate from and electrically connected to the signal switching part, each said pixel light sensitive area being defined by the pattern of the bottom electrode on said light-sensitive part which connects to said signal switching part, the improvement comprising, said bottom electrodes forming a pattern whereby adjacent pixels overlap in both the column and row direction,



and a multicolor filter overlaying said pixels and being patterned corresponding to said bottom electrode pattern.

4,441,124

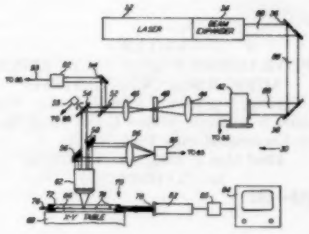
TECHNIQUE FOR INSPECTING SEMICONDUCTOR WAFERS FOR PARTICULATE CONTAMINATION

Richard W. Heebner, Solebury Township, Bucks County, Pa., and Randal L. Schmitt, Plainsboro Township, Middlesex County, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,523

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—106 **6 Claims**



1. An apparatus for detecting particulate material on the surface of a semiconductor wafer having a pattern thereon, comprising:

means for scanning a beam of light over the patterned surface of the wafer at an angle normal thereto; and

a plurality of detectors mounted circumferential of the wafer and substantially coplanar with the surface thereof for detecting light scattered substantially along the surface of the wafer by the particulate material and not the pattern.

4,441,125

IMAGE SENSOR USING DYNAMIC RANDOM ACCESS MEMORY

Ward D. Parkinson, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Nov. 3, 1981, Ser. No. 317,876

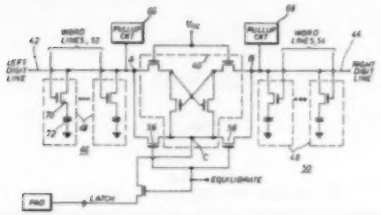
Int. Cl.³ H04N *3/14*

U.S. Cl. 358—213 **11 Claims**

1. A solid state image sensor comprising:

(a) a dynamic random access memory system having one or more arrays of dynamic random access memory cells adapted to have at least two data states, said memory cells including one or more MOSFETs, one or more sense amplifiers for comparing the data states of the memory cells to a threshold value, a dummy-cell-capacitor free threshold generator for providing a relatively light-stable threshold value to the one or more sense amplifiers, means

for refreshing the memory cells to restore the data states, and means coupled to the one or more sense amplifiers for writing out an indication of the data states of the memory cells; and



(b) one or more lenses for directing and focusing a light image onto said dynamic random access memory cells thereby to alter the data states of the memory cells in response to the light image.

4,441,126

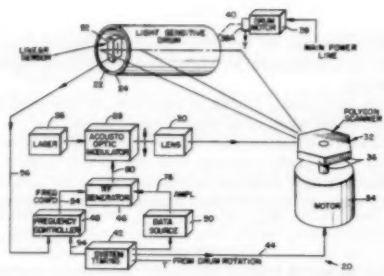
ADAPTIVE CORRECTOR OF FACET ERRORS IN MIRROR SCANNING SYSTEMS

Nelson L. Greenig, Norristown; John R. Taylor, North Wales, and Richard S. Schwartz, Willow Grove, all of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed May 6, 1982, Ser. No. 375,593

Int. Cl.³ H04N *1/30*

U.S. Cl. 358—293 **19 Claims**



17. A beam deflection system comprising means responsive to the frequency of a drive signal for deflecting a beam of radiant energy, means for sensing the position of said beam, said sensing means including a circuit for developing electric signals designating said position; means responsive to said signals of said sensing means for altering the value of said frequency; means coupled to said altering means for generating a signal proportional to the average of a succession of frequency values; and means coupled between said generating means and the circuit of said sensing means for altering component parameters of said circuit in response to the signal of said generating means to compensate for drift in said component parameters.

4,441,127

TAPE DRIVE DEVICE IN RECORDING AND REPRODUCING DEVICE

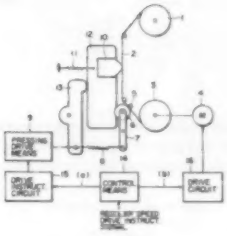
Yoshiharu Ueki, and Shouzaburou Sakaguchi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 25, 1982, Ser. No. 352,435

Claims priority, application Japan, Feb. 27, 1981, 56-27285

Int. Cl.³ G11B *15/18*

U.S. Cl. 360—71 **6 Claims**



1. In a magnetic tape recording and/or reproducing device, a tape drive device comprising:

a reel motor for winding a magnetic tape;

a capstan and a pinch roller operative, when actuated, for holding and running said magnetic tape at a regular speed;

pressing drive means for pressing said pinch roller against said capstan under a predetermined pressure;

a magnetic head which is moved to a predetermined position in association with the operation of said pressing drive means; and

control means for starting said pressing drive means in response to a regular speed drive instruction signal, and starting said reel motor after the lapse of a predetermined time.

4,441,128

ROTARY TRANSDUCER HEAD ASSEMBLY

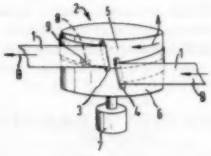
Takeo Ohba, and Hirohisa Koga, both of Atsugi, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 156,490, Jun. 4, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 363,086

Claims priority, application Japan, Jun. 9, 1979, 54-72541; Jun. 9, 1979, 54-72542

Int. Cl.³ G11B *21/02*

U.S. Cl. 360—75 **7 Claims**



1. A rotary magnetic head assembly for a helical scan video tape recorder, comprising:

a tape guide arrangement including a cylindrical drum having a rotary head support associated therewith and rotating about the central axis of said drum, and means for helically guiding a video tape about said drum,

first and second bi-morph leaves disposed in substantially parallel, spaced apart planes and extending generally in radial directions in respect to said axis of the drum, said bi-morph leaves being both deflectable in the same direc-

tion out of said planes in response to the application of a control signal thereof,

means rigidly securing radially inner end portions of said first and second bi-morph leaves to said rotary head support so that said planes of the bi-morph leaves, when the latter are at rest, are substantially perpendicular to said axis,

a transducer head, and

a deflectable member carrying said head and being connected to the radially outer ends of said bi-morph leaves for positioning said head in proper contacting relation to the tape guided about said drum, said deflectable member having first and second end portions secured to said radially outer ends of the first and second bi-morph leaves, respectively, and a connecting portion extending between said first and second end portions and carrying said heat at a radial distance from said radially outer ends of the bi-morph leaves which is short relative to the extent of said bi-morph leaves, said deflectable member having elastically flexible portions at least at junctions of said first and second end portions with said connecting portion, and said elastically flexible portions deflecting in response to deflection of said bi-morph leaves for maintaining said head in said proper contacting relation to the tape.

4,441,129

EJECT DEVICE OF MAGNETIC RECORDING TAPE DRIVING APPARATUS FOR TAPE CASSETTE

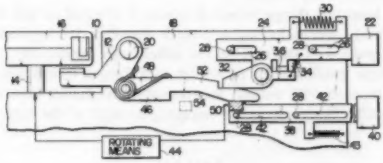
Toshihiro Nakao, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,079

Claims priority, application Japan, Oct. 16, 1980, 55-147731[U]

Int. Cl.³ G11B *15/24*

U.S. Cl. 360—96.5 **16 Claims**



1. An eject device used in a magnetic recording tape driving apparatus having a reel shaft on which a tape cassette is mounted, rotating means for rotating the reel shaft, and an eject member which is free to rotate about a rotating center between a first position in which the eject member is spaced apart from the tape cassette mounted on the reel shaft and a second position in which the eject member comes in contact with the tape cassette to disengage the tape cassette from the reel shaft, said eject device comprising:

a first movable member which is free to move between a first position and a second position;

a second movable member which is free to move between a first position and a second position, said second movable member prohibiting said rotating means from rotating said reel shaft at the first position of said second movable member, and said second movable member permitting said rotating means to rotate said reel shaft at the second position of said second movable member;

a rotating member which is connected to the eject member at a position spaced apart from said rotating center of said eject member, said rotating member being free to move between a first position located within a path of movement between said first position and said second position of said first movable member and a second position located within a path of movement between said first position and said second position of said second movable member, said rotating member being located at said first position thereof when said second movable member moves to said first position thereof, and said rotating member being located at said second position thereof when said second movable member moves to said second position thereof; and

engaging means coupled to said rotating member, and which engages with said first movable member when said rotating member is located at said first position thereof, so that said eject member moved from a first position to a second position thereof when said first movable member moves from said first position to said second position thereof, and said engaging means disengaging from said first movable member when said rotating member is located at said second position thereof.

4,441,130

CARRIAGE FOR A SCANNING HEAD IN RECORDING AND/OR PLAYBACK APPARATUS FOR DISK RECORDS

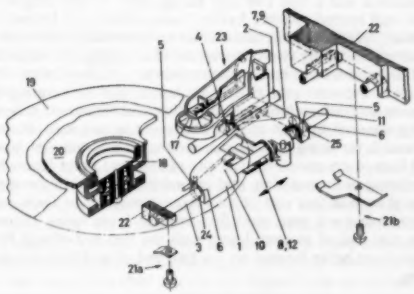
Udo Boehm; Klaus Schulze-Berge, both of Ludwigshafen, and Roland Brotzler, Hochdorf-Assenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 117,130, Jan. 31, 1980, abandoned. This application Dec. 3, 1981, Ser. No. 327,101

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 7903033[U]

Int. Cl.³ G11B *21/08*

U.S. Cl. 360—106 **5 Claims**



1. In a recording and/or playback apparatus for recording disks, especially flexible magnetic disks in cartridges, said apparatus having a scanning head mounted for translational movement relatively to said disk by means of a carriage,

a guiding arrangement for said carriage, comprising:

two parallel cylindrical guide rods, the first supporting and guiding said carriage longitudinally and the second supporting the carriage and guiding the carriage against movement about the axis of the first rod,

said carriage having for the guidance thereof relatively to said first rod, two coaxially, longitudinally spaced bearing apertures with at least two planar faces extending in cross-section at an angle to each other,

said carriage having, for the guidance thereof relatively to said second rod, an aperture with a planar surface, and

said carriage having a first and a second leaf spring urging said faces and said surface against said two rods, respectively,

said first leaf spring urging the carriage with said two planar faces into engagement with said first rod along two parallel lines of contact corresponding to generatrices of said first rod and located generally opposite to, and symmetrically on the two sides, respectively, of the central plane of flexing movement of the first spring, and

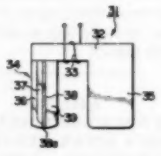
the carriage and both of the leaf springs being integrally molded of plastic material.

4,441,131

MAGNETIC HEAD

Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 13,267, Feb. 21, 1979. This application Jun. 25, 1981, Ser. No. 277,122
Claims priority, application Japan, Mar. 8, 1978, 53/26201
Int. Cl.³ G11B 5/25, 5/22, 5/12
U.S. Cl. 360—119 1 Claim



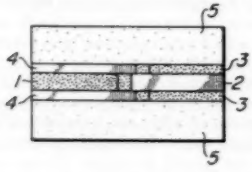
1. A magnetic head for use in record/playback of a magnetic tape having a longitudinal axis extending along the length of the tape, said tape including a first magnetizable layer having high permeability and a second magnetizable layer which includes an axis of magnetization perpendicular to said longitudinal axis and which is attached to said first magnetizable layer, said magnetic head comprising a first member and a second member magnetically coupled, said first member having a low reluctance and a first free end facing close to said magnetic tape, said second member having a second free end formed as a record/playback pole, said second member being a laminated structure including two outer layers of non-magnetic material and first and second internal layers having a high permeability disposed between said two outer layers and cooperating to prevent saturation of the recording flux, said first internal layer being covered by one of said two outer layers, said second internal layer being a thin layer narrower than said first layer and formed on one surface of one of said two outer layers by sputtering or evaporation, said second internal layer extending to said second free end of said second member to form said record/playback pole, said first internal layer being shorter than said second internal layer, with the free end of said first outer layer being formed on the free end of said first internal layer.

4,441,132

MAGNETIC HEAD DEVICE

Shigetoshi Morita, and Hirohide Yamada, both of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 371,580
Claims priority, application Japan, Apr. 30, 1981, 56-65723
Int. Cl.³ G11B 5/16, 5/22
U.S. Cl. 360—126 2 Claims



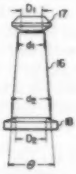
1. A magnetic head device comprising a recording playback magnetic head and erasing magnetic head, each of which consisting of cores made from a ferrite of Mn-Zn system and a reinforcement plate made from a non-magnetic ceramic material and bonded to respective cores; and sliders made from a non-magnetic ceramic material and united with said magnetic heads; wherein said non-magnetic ceramic material for said reinforcement plate and said non-magnetic ceramic material for said sliders have thermal expansion coefficients different from each other.

4,441,133

TAPE GUIDE OF MAGNETIC RECORDING AND REPRODUCING APPARATUS

Tsuneo Ogawa; Manabu Ikeda; Seii Miyakawa, all of Yokohama; Kazunori Iijima, Ibaraki; Takao Terayama, Kashiwa, and Takeshi Matsui, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 282,806
Claims priority, application Japan, Jul. 11, 1980, 55/96935[U]
Int. Cl.³ G11B 15/60; B65H 23/04
U.S. Cl. 360—130.22 13 Claims



1. A guide roller suitable for use in a tape traveling system of a magnetic recording and reproducing apparatus, the guide roller comprising:

a roller body means for guiding a tape during a travel thereof through a magnetic recording and reproducing apparatus, said roller body means having a diameter smoothly increasing axially from a first end to a second end of the roller body means;

at least one flange means disposed at the end of said roller body means having a greater diameter for regulating a position of the tape on the roller body means; and

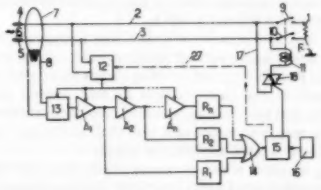
a tape guide surface means on said flanges means which is tapered with respect to a longitudinal center axis of the roller body means for engaging an edge of the tape.

4,441,134

CIRCUIT BREAKERS SENSITIVE TO LEAKAGE CURRENTS

Jacques Lewiner, 5, rue Bory d'Arnex, 92210 Saint-Cloud; Didier Perino, 10, rue Bellevue, 92150 Suresnes, and Claude Hennion, 18, rue Flatters, 75005 Paris, all of France

Filed Mar. 18, 1982, Ser. No. 359,494
Claims priority, application France, Mar. 18, 1981, 81 05451
Int. Cl.³ H02H 3/28
U.S. Cl. 361—45 11 Claims



1. Circuit breaker for automatically cutting off the alternating current supply of an electrical receiver on the appearance of a leakage current between any point of this receiver and ground, said circuit breaker comprising a differential transformer for sensing the current flow in supply wires joining the receiver to an electrical supply source, said transformer being arranged so as to generate automatically in another conductor

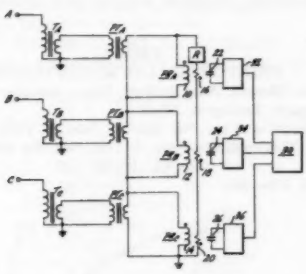
wire an electrical voltage V_O when there is an unbalance between the current flowing in said supply wires, and means responsive to said voltage said voltage V_O for automatically opening a switch connected to one at least of said supply wires after the amplitude of the voltage V_O has reached at least a predetermined threshold, the abovesaid switch being constituted by the contact of a relay arranged to be open as long as said relay is not supplied electrically, said voltage responsive means being connected between the source and the switch, and comprising a circuit of n amplifiers connected in a series and supplied with said voltage V_O after rectification thereof, n being an integer greater than 1, a number n of delay circuits supplied respectively by the output voltages from the n amplifiers, each delay circuit being adapted to produce, after each generation of a voltage signal V_O starting at a moment t_O, a voltage pulse U_i delay by a time delay t_i with respect to t_O, only those pulses being produced which correspond to delays t_i less than the actual duration of the signal V_O, means, with n inputs and one output, for receiving the pulses U_i at the various inputs thereof and for generating a control signal at its output as soon as the amplitude of one of these pulses reaches or exceeds a predetermined threshold W, and electronic means connected to said output and arranged so as to cut off automatically the supply of the relay at the time a control signal is generated at said output.

4,441,135

THREE-PHASE POWER TRANSMISSION LINE PHASE-TO-GROUND FAULT RESPONDER

Robert E. Drain, Butte, Mont., assignor to The Montana Power Company, Butte, Mont.

Filed Aug. 6, 1982, Ser. No. 405,926
Int. Cl.³ H02H *3/16*
U.S. Cl. 361—47 **11 Claims**



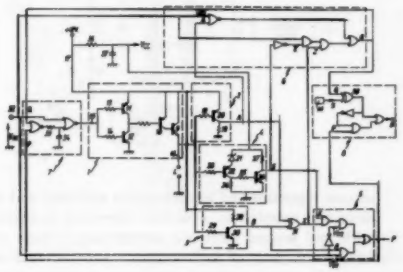
1. A three-phase power transmission system phase-to-ground fault responder comprising individual phase-energized elements producing output voltages related to the respective system phase-to-ground voltages and being serially interconnected to produce a net voltage representing the vector sum of such voltages, individual fault-to-ground sensors individual to the respective phases, each such sensor having first and second control elements requiring cophased energization for actuation of that sensor, the first control elements being individually connected for energization by voltage related in amplitude and phase to the respective said system phase-to-ground voltages, the second control elements being connected across the series of serially interconnected phase-energized elements and each sustaining current flow related in phase and amplitude to said net voltage, whereby said sensors remain unactuated with the system three-phase voltages in balance, and whereby occurrence of a phase-to-ground fault of one phase of the system produces substantially cophased energization of the first and second control elements of the sensor associated with that phase for actuating that sensor, and respective phase-associated responder means responsive selectively to actuation of the individual sensors.

4,441,136

SWITCHING CIRCUIT

Michael J. Hampshire, Liversedge, England, assignor to Salplex Limited, London, England

Continuation of Ser. No. 85,289, Oct. 16, 1979, abandoned. This application Jun. 4, 1982, Ser. No. 384,943
Claims priority, application United Kingdom, Oct. 21, 1978, 41475/78
Int. Cl.³ H02H *7/20*
U.S. Cl. 361—88 **10 Claims**



1. A switching circuit comprising a solid state switch having an input and output, a load connected to the output of the solid state switch, switch sensing circuitry means connected to the load for indicating current therein, drive circuitry means for driving the solid state switch which, in turn activates, the switch sensing circuitry means so that the switch sensing circuitry means senses an operating characteristic of the solid state switch, said switch sensing circuitry means comprising at least three individual circuits, said at least three individual circuits being connected to the load for measuring the the voltage across the solid state switch and issuing signals indicating whether operating values of said at least three individual circuits are greater or less than given threshold values for said at least three individual circuits, and digital logic circuit means connected to said at least three individual circuits for receiving said signals issued by said at least three individual circuits and for producing two digital output signals from the signals received from said at least three individual circuits, one of said two signals indicating whether or not a fault in the solid state switch or in the load is present, and another of said two signals indicating the seriousness of said fault.

4,441,137

HIGH VOLTAGE PROTECTION FOR AN OUTPUT CIRCUIT

Leopold A. Harwood, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

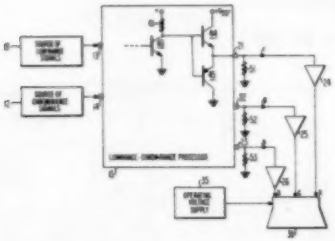
Filed Aug. 30, 1982, Ser. No. 412,899
Int. Cl.³ H02H *7/20*
U.S. Cl. 361—91 **6 Claims**

1. In a signal processing system comprising an output terminal at which spurious high voltage transients may appear; and a semiconductor device susceptible of damage from electrical stress caused by high voltage transients; a protection circuit comprising:

a normally conductive first transistor of one conductivity type having an input first electrode coupled to said semiconductor device, a low impedance second electrode coupled to said output terminal, and a third electrode coupled to a first operating potential and with said second electrode determining a main current conduction path of said first transistor; said first transistor being normally

operative for coupling signals from said semiconductor device to said output terminal, and being operative for diverting current transients associated with high voltage transients of one polarity to said first operating potential via said main current path of said first transistor; and

a second, normally non-conductive, transistor of an opposite conductivity type with a first electrode coupled to said first electrode of said first transistor, a low impedance second electrode coupled to said second electrode of said



second transistor and to said output terminal, and a third electrode coupled to a second operating potential and with said second electrode determining a main current conduction path of said second transistor; said second transistor being rendered conductive in response to transients appearing at said output terminal with an opposite polarity for diverting associated transient currents to said second operating potential via said main current path of said second transistor.

4,441,138

CHARGE CELL

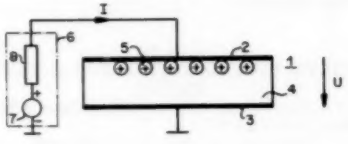
Jean-Frederic Moser, Oberwil, and Heinrich P. Baltes, Zug, both of Switzerland, assignors to LGZ Landis & Gyr Zug A.G., Zug, Switzerland

Filed Jan. 20, 1982, Ser. No. 340,841

Claims priority, application Switzerland, Jan. 26, 1981, 468/81

Int. Cl.³ H01G *1/08, 4/06*

U.S. Cl. 361—274 **12 Claims**



1. A charge cell, for use in measuring charge values, free of any electrolyte and free of any glassy or amorphous composition, and arranged to transfer charges between two electrodes, so that at the end of said transfer the potential difference across sais charge cell will suddenly increase,

comprising in combination,

two electrically conducting electrodes spaced apart from one another, and

a single layer of one single solid dielectric material disposed between said electrodes, and including a predetermined quantity of carriers of a positive charge trapped and remaining trapped therein.

4,441,139

PROCESS FOR PRODUCING A WOUND CAPACITOR AN APPARATUS FOR IMPLEMENTING THE PROCESS AND A CAPACITOR THUS OBTAINED

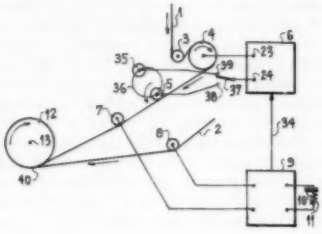
Daniel Bernard, Bagnolet, France, assignor to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Feb. 19, 1982, Ser. No. 350,155

Claims priority, application France, Feb. 27, 1981, 81 03991

Int. Cl.³ H01G *1/015, 4/06, 7/00*

U.S. Cl. 361—304 **8 Claims**



1. In a process for producing a wound capacitor of capacity C, in which at least two films of metal coated dielectric materials are wound one on the other, the metal layers forming the plates of said capacitor, the instantaneous capacity Cx of the capacitor being measured at all times by capacity measuring means, when Cx is close to but less than C, partial metal stripping of one of the metal coated films is carried out so as to maintain thereon a metal coated strip, connected electrically to the corresponding plate of the capacitor and allowing the value of capacity Cx to be adjusted accurately to the value C, without slowing down the winding speed of said capacitor.

4,441,140

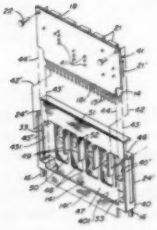
PRINTED CIRCUIT BOARD HOLDER

Maurice Richard, New Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 208,713, Nov. 20, 1980, abandoned. This application Jan. 3, 1983, Ser. No. 454,924

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—386 **11 Claims**



1. A printed circuit board and holder wherein the holder comprises a thermally conductive frame having a peripheral boundary, a first portion of the peripheral boundary having an integrally formed thermal transfer guide along a portion of the outermost periphery of said frame;

said frame having a circuit board supporting shoulder which supports a planar printed circuit board having connector pins at one end of said board such that said connector pins are disposed adjacent to and within a second portion of the peripheral boundary disposed opposite said first portion of said peripheral boundary;

said peripheral boundary of said frame defining within said frame a volume substantially equal to the product of area within said boundary and the thickness of said frame;

said printed circuit board having heat producing electrical elements mounted thereon which in combination with said board have a volume disposed within the volume of said frame and having said heat producing elements mounted on one side thereof within the volume of said frame, said board and said heat producing elements having a combined thickness less than the thickness of said frame, wherein the improvement comprises:

said frame includes additionally a thermally conducting flat non-perforated plate integrally formed with and unitary with said frame and adjacent to said heat producing elements to provide a high thermal conductance path with said frame along at least the portion of the peripheral boundary of said frame having said integrally formed thermal transfer guide, said thermally conducting plate being substantially planar and having a surface which is coplanar with a surface of the periphery of said frame and parallel with said planar printed circuit board; said plate having plural depressions at the locations of said heat producing elements whereby said elements extend into said depressions, and

a thermally conductive material in contact with and between said heat producing elements and said plate.

4,441,141

LIGHT REFLECTOR UNIT FOR A PHOTOGRAPHIC CAMERA

Anthony T. S. Lo, 'Woodgreen' 62 Conduit Rd., Hong Kong, Hong Kong

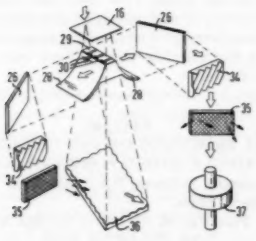
PCT No. PCT/GB81/00193, § 371 Date May 24, 1982, § 102(e) Date May 24, 1982, PCT Pub. No. WO82/01258, PCT Pub. Date Apr. 15, 1982

PCT Filed Sep. 17, 1981, Ser. No. 385,404

Claims priority, application United Kingdom, Mar. 16, 1981, 8108102

Int. Cl.³ G03B *15/02*

U.S. Cl. 362—17 **12 Claims**



1. A light reflector unit for use with a photographic camera for reflecting light from a light source towards a subject to be photographed, said unit comprising a hollow casing which can be positioned on a camera between a light source and the lens unit of the camera, a window in the casing for admitting light from said light source into the casing, at least one light emitting outlet from the casing, means for positioning the casing with said outlets facing the same direction as the lens unit of said camera, means within the casing for splitting the admitted light, means for condensing at least some of the admitted light into at least two beams of light, and light reflective surfaces within the casing for reflecting each beam of light to said light emitting outlet, said outlet being provided with a lens or a diffuser.

4,441,142

UNDERWATER FLASHLIGHT

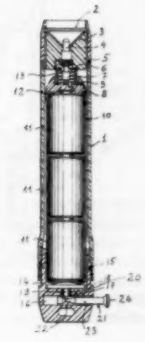
Giovanni Garofalo, Rapallo, Italy, assignor to AMF Inc., White Plains, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,566

Claims priority, application Italy, Jul. 21, 1981, 15185/81[U]

Int. Cl.³ F21L *7/00*

U.S. Cl. 362—158 **3 Claims**



1. In a flashlight of the type wherein spring loaded battery means are mounted in a casing assembly for displacement along the longitudinal axis to close the normally open electrical bulb-battery circuit in one direction and the displacement in the opposite direction opens said circuit, wherein the improvement comprises:

plug means fastened to and closing the casing assembly, said plug means having an aperture through one side transverse to said casing axis and an axial aperture connecting the transverse aperture with the casing interior;

shaft means extending through the transverse aperture for displacement transverse to said axis and having a camming portion within the plug and an operating portion outside of the plug;

cam follower means extending from the shaft means through the axial aperture to the battery means and co-operating with the shaft means camming portion to transmit shaft transverse displacement to battery means axial displacement whereby shaft displacement in one direction connects the bulb-battery circuit and displacement in the opposite direction disconnects it; and

means for preventing leakage into the casing assembly.

4,441,143

PHOTO VOLTAIC LIGHTING FOR OUTDOOR TELEPHONE BOOTH

Charles T. Richardson, Jr., Norcross, Ga., assignor to Gladwin, Inc., Oakwood, Ga.

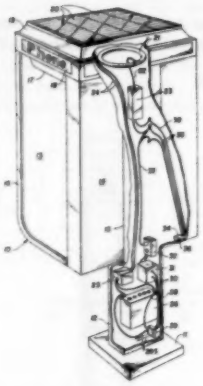
Continuation-in-part of Ser. No. 177,243, Aug. 11, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,272

Int. Cl.³ F21L *7/00*

U.S. Cl. 362—183 **6 Claims**

1. An illumination system for a public telephone facility comprising in combination, an illumination means including one or more fluorescent lamps, a photo voltaic electrical energy generating means, an electrical storage battery means, temperature compensated battery charge controller regulator means for controlling the maximum electrical energy stored in said electrical storage battery means, means for limiting the minimum charge remaining in the storage battery means and preventing operation of said illumination means when said minimum charge is reached, means for detecting the level of ambient light conditions, control circuit means connected to

said means for detecting the level of ambient light for causing said one or more fluorescent lamps to be energized from said



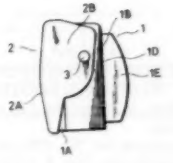
electrical storage battery means when the ambient light falls below a predetermined level.

4,441,144

AUXILIARY HEAD LAMP DEVICE FOR CAR EQUIPPED WITH COVER

Tatsuo Horiuchi, and Kazushige Kiyota, both of Tatebayashi, Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1982, Ser. No. 363,515
Claims priority, application Japan, Apr. 17, 1981, 56-57018
Int. Cl.³ F21V *17/00*
U.S. Cl. 362—375 **7 Claims**



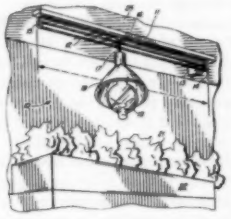
1. An auxiliary lamp device equipped with a cover for a vehicle, comprising: an auxiliary lamp for a vehicle, said lamp including an enclosed casing and a lens attached to said casing, said auxiliary lamp attachable to a body portion of a vehicle; a cover rotatably mounted on said casing for rotation between a closed position where it covers said lens of said auxiliary lamp and an open position where it uncovers said lens of said auxiliary lamp; and a cover driving mechanism for rotating said cover from the closed position to the open position, including a solenoid in circuit with a switch; wherein the switch of said solenoid is for disposition inside the interior cabin of the vehicle.

4,441,145

TRACKING MEANS FOR MOVING A LIGHT SOURCE ACROSS A PLANTER SURFACE TO SIMULATE SUNLIGHT

Russell J. Antkowiak, Tempe, Ariz., assignor to Aqua Culture, Inc., Tempe, Ariz.

Filed Aug. 23, 1982, Ser. No. 410,405
Int. Cl.³ B60Q *1/12*
U.S. Cl. 362—384 **4 Claims**



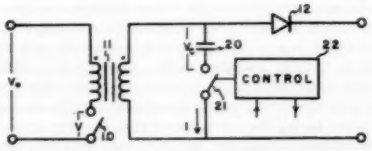
1. Apparatus for sustaining indoor plant growth comprising:
an elongated rail,
said rail comprising a ceiling mountable, hollow, tubular member slotted along its bottom surface,
a carriage means supported on said rail for guided movement therealong,
said carriage means comprising an elongated arm extending at one end through the slot in said bottom surface,
roller means mounted on said one end of said arm inside of said tubular member for support and guided movement of said arm along said rail,
means connected to said carriage means for moving said carriage means in a reciprocating manner along said rail,
said means comprising an electric motor driven conveyor supported on said rail and attached to said carriage means for moving said carriage means continuously in a straight line along a closed loop path,
said conveyor comprising a pair of sprockets one mounted at each end of said rail and an endless chain mounted over said sprockets to form said closed loop path,
linkage means pivotally attached to said chain at one end and to said carriage means at the other end to provide continuous movement of said carriage means along said rail, and
a light means suspended from said carriage means for moving in a reciprocating manner back and forth over an associated planter.

4,441,146

OPTIMAL RESETTING OF THE TRANSFORMER'S CORE IN SINGLE ENDED FORWARD CONVERTERS

Patrizio Vinciarelli, Skillman, N.J., assignor to Vicor Corporation, Westford, Mass.

Filed Feb. 4, 1982, Ser. No. 345,799
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—20 **6 Claims**



1. In a single ended forward converter in which energy is transferred from a primary winding to a secondary winding of a transformer during the ON period of a primary switch, circuitry for recycling the magnetizing energy stored in said

transformer to reset it during the OFF period of said primary switch, comprising:

a storage capacitor;

an auxiliary switch connected in series with said storage capacitor;

a switch control circuit operating said auxiliary switch in accordance with a control logic such that (a) said auxiliary switch is opened prior the ON period of said primary switch, (b) said auxiliary switch remains open throughout the ON period of said primary switch, (c) said auxiliary switch is closed after the ON period of said primary switch.

4,441,147

CIRCUIT ARRANGEMENT FOR THE CONTROLLED SUPPLY TO A LOAD

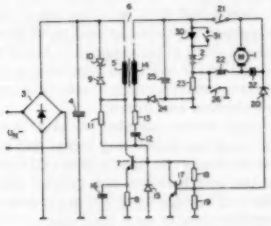
Gerhard E. Schwarz, Altena, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,745

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101375

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—21 **6 Claims**



1. A circuit for supplying a constant DC voltage to an electrical load and, alternatively, a relatively constant DC current to an electrical storage battery, connected in parallel with said electrical load from an input voltage source of relatively varying voltage potential, comprising:

a blocking oscillator including a transformer having a primary winding and a secondary winding, a switching transistor having first and second load terminals and a control terminal, and a first resistor;

said primary winding, said first and second load terminals of said switching transistor and said first resistor being connected in series across said input voltage source;

rectifier means connected in series with said electrical load across said secondary winding;

a controlling transistor having first and second load terminals and a control terminal;

a reference voltage element connected across said first and second load terminals of said controlling transistor and connected to said control terminal of said switching transistor; and

a Zener diode having an anode connected to the control terminal of said controlling transistor and a cathode connected to said parallel arrangement of said electrical load and said storage battery.

4,441,148

POWER CONVERTING DEVICE AND A PROTECTION DEVICE FOR THE SAME

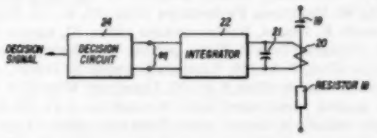
Akio Hirata, Fuchuu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 9, 1982, Ser. No. 347,168

Claims priority, application Japan, Feb. 26, 1981, 56-27421

Int. Cl.³ H02H *7/125*

U.S. Cl. 363—54 **17 Claims**



1. A power converting device, comprising:

at least one power converting element;

first means, coupled to said at least one power converting element, for detecting a reverse voltage;

second means, coupled to said first means, for receiving said detected reverse voltage and for integrating said detected reverse voltage to produce a reverse voltage/time integral signal; and

third means coupled to said second means for receiving said reverse voltage/time integral signal and for producing a decision signal only when the amplitude of said reverse voltage/time integral signal exceeds a first prescribed value, said decision signal indicating that said at least one power converting element is extinguished.

4,441,149

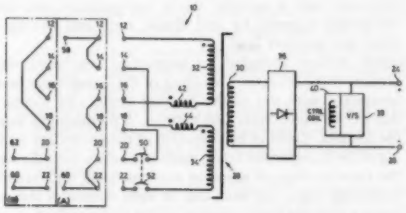
MULTI-VOLTAGE TRANSFORMER INPUT CIRCUITS WITH PRIMARY REACTOR VOLTAGE CONTROL

Alfred M. Hase, 390 Tapscott Rd., Scarborough, Ontario, Canada MIB 3Z9

Filed Feb. 16, 1982, Ser. No. 349,386

Int. Cl.³ H02P *13/24*

U.S. Cl. 363—91 **9 Claims**



1. An input circuit for a transformer in a regulated power supply, whereby the throughput power of the transformer is controlled by synchronous operating current control means, wherein:

the primary winding of said transformer has at least first and second sections that are bifilar wound on a single core, each of said first and second sections having a polarity of winding;

said synchronous operating current control means comprises a pair of first and second like devices having polarity;

the first of said pair of synchronous operating devices being connected in series with said first primary winding section, and in opposite polarity thereto;

the second of said pair of synchronous operating devices being connected in series with said second primary winding section, and in the same polarity therewith;

said first and second primary winding sections and their

respective synchronous operating devices in series therewith being arranged so that each series connected primary winding section and synchronous operating device may be connected either in series or parallel with the other series connected primary winding section and synchronous operating device.

4,441,150

HIGH-VOLTAGE RECTIFIER UNIT

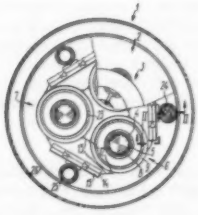
Boris I. Albertinsky, Nevsky prospekt 84, kv. 19, Leningrad; Nina M. Dmitrieva, Pavlovskaya ulitsa, 84, kv. 11, Kolpino; Anatoly K. Evseev, Bukharestskaya ulitsa, 33, korpus 1, kv. 25, Leningrad; Ivan P. Zotov, poselok Metallostroi, Pushkinskaya ulitsa, 8, kv. 50, Leningrad; Andrei S. Ivanov, ulitsa Kuznetsovskaya ulitsa, 8, kv. 33, Leningrad; Mikhail P. Svinin, poselok Metallostroi ulitsa Bogaichuka, 4, kv. 25, Leningrad; Valentin A. Suslov, ulitsa Petra Smorodina, 12, kv. 130, Leningrad, and Mikhail T. Fedotov, poselok Metallostroi, Polevaya ulitsa, 22, kv. 58, Leningrad, all of U.S.S.R.

PCT No. PCT/SU80/00066, § 371 Date Dec. 21, 1981, § 102(e) Date Dec. 21, 1981, PCT Pub. No. WO81/03093, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 25, 1980, Ser. No. 336,395

Int. Cl.³ H02M *7/06*

U.S. Cl. 363—126 **4 Claims**



1. A high-voltage rectifier unit comprising

a vessel filled with an electrically insulating fluid;

a transformer accommodated in said vessel and having a sectionalized secondary winding, each section of which is provided with a metallic shield and includes two coils connected in series by said shield, each coil having an inner and an outer lead;

rectifier devices mounted on supporting insulators, each section of the secondary winding of the transformer being connected with one of the rectifier devices by means of one of the outer leads and forming a rectification stage, the metallic shield of each section of the secondary winding of the transformer being made as an open metallic ring, the metallic rings of adjacent sections being separated by insulating rings, and each coil of each section of the secondary winding being secured on the outer surface of one of the metallic rings and being connected with the metallic ring by its inner lead, said metallic and said insulating rings being joined together to form a single stiff structure.

4,441,151

APPARATUS FOR TUNING PID CONTROLLERS IN PROCESS CONTROL SYSTEMS

Shuji Hayashibe, Tokyo, Japan, assignor to Toyo Systems, Ltd., Tokyo, Japan

Continuation of Ser. No. 198,185, Oct. 17, 1980, which is a continuation-in-part of Ser. No. 115,197, Jan. 25, 1980, abandoned. This application Aug. 29, 1983, Ser. No. 515,801

Claims priority, application Japan, Nov. 4, 1977, 52-131511

Int. Cl.³ G05B *13/02*

U.S. Cl. 364—157 **5 Claims**

1. Apparatus for intermittent use in a control loop having a sensor and a driver and having a process value of a first magnitude to determine the optimum setting for a controller in such control loop;

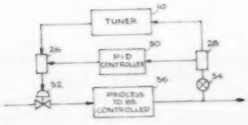
said apparatus having an input terminal for connection to said sensor when the transfer function of said control loop is to be determined and an output terminal for connection to said driver during determination of the transfer function of said control loop;

said apparatus including a bi-polar-pulse generator coupled to said output terminal;

a manually operated switch electrically coupled to said bi-polar-pulse generator, said bi-polar-pulse generator being responsive to each actuation of said manually operated switch to produce at said output terminal a pulse combination comprising a single set of a positive and a negative-going rectangular pulse each having a magnitude which is small with respect to said first magnitude;

timing means;

said bi-polar-pulse generator being coupled to said timing means;



time-and-amplitude-sampling-and-storage means coupled to said input terminal of said apparatus and to said timing means to sample and store, as a function of time, the loop-response voltage appearing at said input terminal of said apparatus as a result of the application of said pulse combination to said driver from said apparatus, whereby a loop response curve corresponding to said pulse combination is effectively derived and stored;

first calculating means coupled to said time-and-signal-amplitude-sampling-and-storing means and to said timing means and responsive to signals from said timing means to calculate the area between said process response curve and a reference voltage level and to produce an electrical signal representative of such area; and,

further calculating means coupled to said first calculating means and responsive to the area-representative electrical signal therefrom to calculate the transfer function of said process.

4,441,152

DATA PROCESSING SYSTEM HAVING RING-LIKE CONNECTED MULTIPROCESSORS RELATIVE TO KEY STORAGE

Tsuguo Matsuura, Hadano; Shunichi Torii, Kokubunji, and Tsuguo Shimizu, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1981, Ser. No. 233,447

Claims priority, application Japan, Feb. 14, 1980, 55-16973

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **17 Claims**

1. A data processing system comprising:

(a) a main storage (MS);

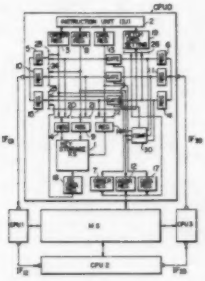
(b) a plurality of central processing units (CPU) having said main storage in common;

(c) key storage (KS) means provided in each of said central processing units, for storing control information for the main storage;

(d) connecting means for connecting said central processing units in cascade in a circular path; and

(e) key processing control means provided in each of said

central processing units, for accessing said key storage means provided in one of said central processing units when a key access request is issued in said central processing unit, and for supplying the content of said key access request including an address, an order and data via said



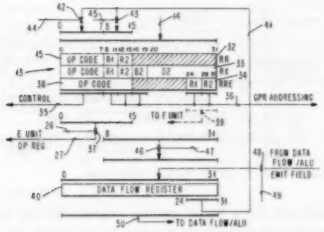
connecting means to all of the other central processing units to access said key storage means provided in said other central processing units, and for preventing the content of said key access request generated by said one of said central processing units from being transferred back to the same unit.

4,441,153

INSTRUCTION REGISTER CONTENT MODIFICATION USING PLURAL INPUT GATES AND A DATA FLOW REGISTER

Robert J. Bullions, III, Poughkeepsie, and Thomas A. Enger, Wappingers Falls, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,812
Int. Cl.³ G06F *9/00, 9/22, 9/30*
U.S. Cl. 364—200 **5 Claims**



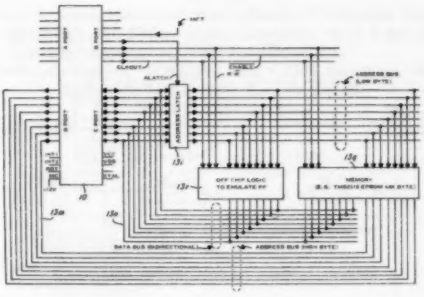
1. A data processing machine including:
an instruction register for storing a program instruction transferred from a program storage device, each instruction, and therefore said instruction register, including at least a first field including an operation code, and a second field;
a data flow register;
input gate means, having inputs connected to said data flow register and outputs connected to said instruction register;
output gate means, having inputs connected to said second field of said instruction register and outputs connected to said data flow register;
control means for controlling the central processing unit in accordance with an operation specified by said first field, including an input control signal means connected to said input gate means, and output control signal means connected to said output gate means for selectively gating data from said data flow register to said instruction register or from said instruction register to said data flow register.

4,441,154

SELF-EMULATOR MICROCOMPUTER

Kevin C. McDonough; John W. Hayn; Jeffrey D. Bellay, and Robert C. Thaden, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1981, Ser. No. 253,644
Int. Cl.³ G06F *11/22, 9/44*
U.S. Cl. 364—200 **3 Claims**



1. A microprocessor system comprising:
(a) a microprocessor device formed in a single semiconductor integrated circuit, including:
first internal memory means for storage of data, and second internal memory means for storage of commands which define operations in the device on said data;
arithmetic and logic means for performing said operations on said data;
register means for temporary storage of said data and temporary storage of addresses for accessing said first and second internal memory means;
a plurality of bus means interconnecting said first and second internal memory means, said arithmetic and logic means, and said register means;
control and timing circuitry having outputs coupled to said internal memory means, said arithmetic and logic means, said register means, and said bus means, for receiving said commands from said second internal memory means via said bus means and causing execution of said commands;
interrupt control circuitry receiving an input from a terminal of said device and coupled to said control and timing circuitry to interrupt the execution of a sequence of said commands,
a plurality of input/output registers and coupling means connecting said input/output registers to said bus means for access by addresses in said register means,
a plurality of input/output terminals for the device coupled to said input/output registers,
emulator control means receiving an input from a terminal of said device and coupled to said control and timing circuitry to disable said second internal memory means, whereby addresses are output to said input/output registers, and said interrupt control circuitry and to disable said coupling means whereby said input/output registers are not accessed by addresses from said register means; and
(b) external memory means for storage of commands which define operations in the device on said data, having an address input and a data output,
(c) external bus means coupled to said address input and said data output of said external memory means, and coupled to said input/output terminals for receiving addresses

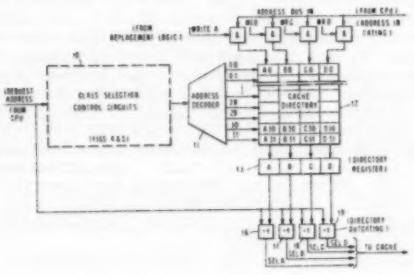
from said register means and for transferring data from the external memory means to said register means.

4,441,155

PAGE CONTROLLED CACHE DIRECTORY ADDRESSING

Robert P. Fletcher, and Daniel B. Martin, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1981, Ser. No. 324,165
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **9 Claims**



1. A method of modifying the addressing of a cache directory with a virtual addres requested by a CPU for accessing a page frame in main storage, the virtual address including an external page address field and an internal page address field, the external page address field being used for addressing the page frame in main storage, a page component field at the high-order end of the internal page address field, a congruence class selection field being taken from the virtual address and including the page component field, the modified cache addressing method comprising the steps of:

selecting a group of contiguous bit positions from the requested virtual address including at least the congruence class selection field and a control bit position which is the lowest-order bit position in the external page address field,

inverting the content of a sub-page bit position in the page component field of the congruence class selection field when the control bit position has one state and not changing the content of the sub-page bit position when the control bit position has another state,

addressing the cache direction with a modified congruence class selection field derived by the inverting step being applied to the congruence class selection field obtained by the selecting step,

whereby improved cache utilization can be obtained by the inverting step redistributing the congruence classes in the cache directory.

4,441,156

INTEGRATED FUEL MANAGEMENT SYSTEM

Dennis E. Barbeau, Temperance, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jan. 21, 1981, Ser. No. 226,632
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—431.02 **11 Claims**

1. An aircraft fuel management system for an aircraft with an on-board aircraft guidance control system, said fuel management system comprising: an aircraft turbine engine having a combustor providing propulsion for the aircraft;

a compressor driven by said turbine engine;

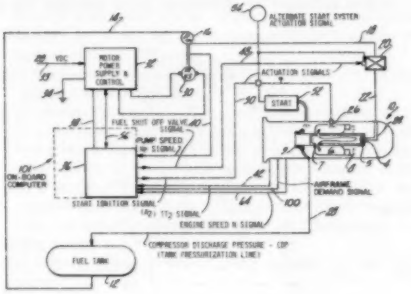
a fuel reservoir;

means operatively connected with said compressor for maintaining said fuel reservoir under constant pressure;

a fuel pump receiving fuel from said fuel reservoir;

a motor controlling said pump so as to provide fuel to said turbine engine;

means for sensing at least one engine condition; and



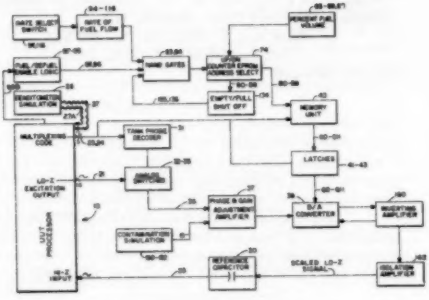
means for controlling said motor, said controlling means responsive to said sensing means.

4,441,157

TEST UNIT FOR AIRCRAFT FUEL GAGING SYSTEM

Robert D. Gerchman, New Brighton; Ronald L. Newport, Fridley, and Martin J. van Dyke, Minneapolis, all of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Nov. 13, 1981, Ser. No. 321,199
Int. Cl.³ G06G *7/50*
U.S. Cl. 364—551 **17 Claims**

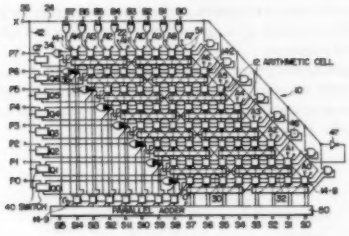


1. A test unit for a liquid gaging system having probe lines for connection to sensors responsive to the depth of a liquid in a tank at particular locations and a common return line connected to said sensors, said system having means for supplying excitation signals to said probe lines and means for reading said sensors via said common lines return for liquid depth information at each of said sensors, said system having means for processing said information to calculate the liquid fuel volume in said tank; said test unit being connected to said probe lines and said return line in lieu of said sensors, said test unit comprising, storage means for storing characterization parameters simulating said sensors based on tank shape and volume and the location of said sensors in said tank with said parameters representing said depth information over a range of simulated tank fill conditions from zero to full, a reference element connected to said return line, control means for setting desired simulated tank levels, and means for processing said excitation signals via said storage means and said reference element to place current values on said return line which correspond to simulated levels set by said control means.

4,441,158
ARITHMETIC OPERATION CIRCUIT

Akira Kanuma, Palo Alto, Calif., assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 23, 1981, Ser. No. 285,980
Claims priority, application Japan, Jul. 31, 1980, 55-105749
Int. Cl.³ G06F 7/52; G05F 7/50
U.S. Cl. 364—758 7 Claims



1. A circuit for performing arithmetic operations on at least one operand, said circuit comprising:

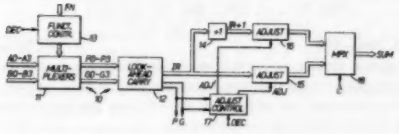
a first number of arithmetic cell groups each corresponding to a different stage of said arithmetic operations circuit and each including a second number of cascade-connected arithmetic cells, said first and second numbers being related to the number of bits in said at least one operand, and each of said arithmetic cells including an adder consisting substantially of complementary MOS transistors and a carry signal output; and

a plurality of carry circuits, each including two carry circuit means cascade-connected to each other and respectively connected to the carry signal output of a third number of cells and to said arithmetic cell groups for performing carry skip processing, each of said carry circuits consisting substantially of enhancement/depletion type MOS transistors.

4,441,159
DIGITAL ADDER CIRCUIT FOR BINARY-CODED NUMBERS OF RADIX OTHER THAN A POWER OF TWO

Peter A. Hart, Cheadle, England, assignor to International Computers Ltd., Stevenage, England

Filed Jul. 7, 1981, Ser. No. 281,300
Claims priority, application United Kingdom, Jul. 10, 1980, 8022572
Int. Cl.³ G06F 7/50
U.S. Cl. 364—771 6 Claims



1. A digital adder circuit operable to form the sum of two n-bit operands representing binary-coded numbers of radix other than a power of two, comprising

(a) a plurality of multiplexers each having two selection control inputs, four data inputs, and a data output,

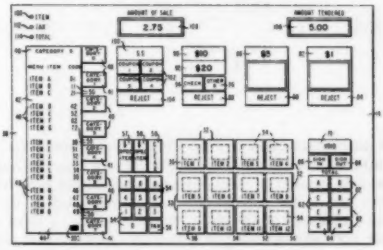
(b) means for feeding corresponding pairs of bits of the two operands to the selection control inputs of the respective multiplexers, and

(c) means for applying a predetermined pattern of bits to the data inputs of the multiplexers to condition the multiplexers to produce, at their data outputs, inter-bit carry generate and carry propagate signals corresponding to the binary addition of the two operands plus a correction value equal to the difference between 2^n and said radix.

4,441,160
POINT OF SALE TERMINAL HAVING PROMPTING DISPLAY

Noris S. Azcua, Huntington Beach; George D. Margolin, Newport Beach, and Audrey Miller, Claremont, all of Calif., assignors to Auto-Register, Inc., Placentia, Calif.

Continuation of Ser. No. 957,912, Nov. 6, 1978, abandoned. This application Mar. 9, 1981, Ser. No. 242,054
Int. Cl.³ G06F 15/21
U.S. Cl. 364—900 33 Claims



1. In a point of sale device for ordering a number of items having a computer electronically interconnected to a keyboard, a memory device and a display device such that actuation of said keyboard causes the retrieval from memory of stored information and the display of the information on the display device comprising:

key members organized into a first and second hierarchy; said first hierarchy known as item keys wherein each key is uniquely identified with a single unit; said second hierarchy known as category keys wherein each key is uniquely identified with a group of single units;

each of said item keys depicting a single unit for being ordered;

each of said category keys depicting a group of single units which can be individually ordered;

the item ordered by the actuation of an item key is constant with respect to the actuation of a category key;

the keyboard containing enough category key members to display substantially all of the units which can be ordered at the device;

actuation of an item key member causes said point of sale device to order a unit;

actuation of a category key member causes said display to show a group of units for sale and the code necessary to order any unit in the group displayed.

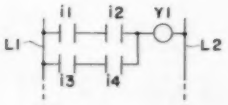
4,441,161
PROGRAMMABLE SEQUENCE CONTROL METHOD AND DEVICES

Junichi Sasaki, and Yoshihiko Okayama, both of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,586
Claims priority, application Japan, Apr. 17, 1980, 55-50713
Int. Cl.³ G06F 9/00
U.S. Cl. 364—900 3 Claims

1. A programmable sequence control apparatus comprising a

first memory device for storing sequence program instructions, an input/output device for introducing input data and delivering output data therethrough, a relay ladder operation device for executing logic operations for a relay ladder circuit having n rows and m columns (n and m are positive integers) in accordance with said program instructions, and a control device for delivering control signals to the relay ladder operation device, the improvement wherein said input/output device includes a second memory device for storing the addresses and the logic conditions of input/output elements, said control device includes a third memory device for storing temporarily contact data fetched out of the second memory device such that the contact data corresponding to each column can be read-out consecutively, and also for storing temporarily branch data fetched out of the first memory device such that the branch data corresponding to each column can be read out consecutively, said relay ladder operation device comprises a first shift register of a series-in and parallel-out type which receives and



stores the contact data corresponding to one column j (j=1, 2, . . . , m) read-out of the third memory device consecutively, a second shift register of a series-in and parallel-out type which receives and stores the branch data corresponding to said column j read-out of the third memory device, a third shift register normally operable in a parallel input/parallel output mode, the contents of which are all initially set to logic "1", and a gate circuit including logic element groups each executing logic operation for one row of said column j of said relay ladder circuit based on the parallel delivered output of said first and second shift registers corresponding to the column j and the parallel delivered output of said third shift register corresponding to the column (j−1), the results of the logic operation for said column j executed in said gate circuit replacing the contents for the column (j−1) of said third register, and said relay ladder operation device, under the control of the control device, repeats said operation for all the columns of said relay ladder circuit starting from the first column to the last column.

4,441,162

LOCAL NETWORK INTERFACE WITH CONTROL PROCESSOR & DMA CONTROLLER FOR COUPLING DATA PROCESSING STATIONS TO COMMON SERIAL COMMUNICATIONS MEDIUM

Terrance L. Lillie, Palo Alto, Calif., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 22, 1981, Ser. No. 256,332
Int. Cl.³ G06F *15/16, 3/04*
U.S. Cl. 364—900 **7 Claims**

1. A local network interface for interface for connecting a common serial communications medium to a data processing station, said station including at least one station processor, comprising;

(a) communications control means for monitoring and formatting the flow of data to and from said interface;

(b) a buffer memory for storing data upon receipt from said medium and for storing data to be transmitted to said medium;

(c) a direct memory access (DMA) controller operatively connected to said communications control means and said buffer memory for controlling the flow of data between said communications control means and said buffer memory;

(d) a control processor operatively connected to said communications controller means, said DMA controller and said buffer memory for controlling the operation of said interface;

(e) an interprocessor communications means for transferring data between said buffer memory and said data processing station;

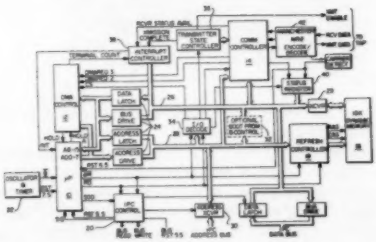
(f) whereby to receive data;

(f1) said control processor initializes said communications control means for receipt of data;

(f2) said communications control means signals said control processor upon detection of a message intended for said interface;

(f3) said control processor initializes said DMA controller;

(f4) said message is received and is formatted by said communications control means and transferred to said buffer memory by said DMA controller;



(f5) said control processor signals said station processor and said message is transferred to said data processing station by said interprocessor communications means; and,

(g) whereby to transmit data:

(g1) said station processor signals said control processor and a message is transferred to said buffer memory by said interprocessor communications means;

(g2) said DMA controller is initialized by said control processor and said communications control means is initialized by said control processor to transmit data;

(g3) when said medium is free, said message is transmitted from said buffer memory to said communications control means by said DMA controller;

(g4) said data reformatted and transmitted by said communications control means.

4,441,163

DYNAMIC SEND QUEUE MODIFICATION SYSTEM

Gary E. Leikam, Austin; Robert L. Wierwille, Leander, and Rebecca S. Wood, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1981, Ser. No. 274,352
Int. Cl.³ G06F *3/04, 3/14*
U.S. Cl. 364—900 **19 Claims**

1. A data communication system for enabling one data transmitting display terminal to communicate with at least one data receiving terminal, the improvement wherein the data transmitting display terminal comprises:

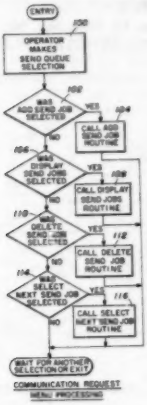
means for forming a queue of entries identifying documents to be transmitted, each of said documents identified by an entry in said queue;

means for sequentially transmitting the documents identified by the entries in said queue;

means operative during said transmission for accessing entries from said queue prior to the transmission of the documents identified by said accessed entries;

means responsive to said means for accessing for completing the transmission of a document being transmitted;

means operative during said transmission for displaying said accessed entries; and



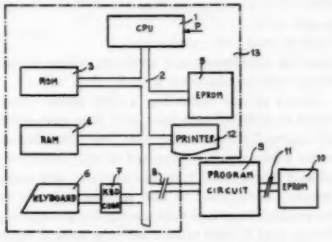
means operative during said transmission for altering said accessed entries prior to the transmission of said documents identified thereby.

4,441,164

ELECTRONIC TELEPRINTING APPARATUS INCLUDING A REMOVABLE PROGRAMMED EPROM

Gianni Pavan, and Mario Lorenzi, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jul. 1, 1981, Ser. No. 279,580
Claims priority, application Italy, Jul. 3, 1980, 68050 A/80
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—900 **10 Claims**



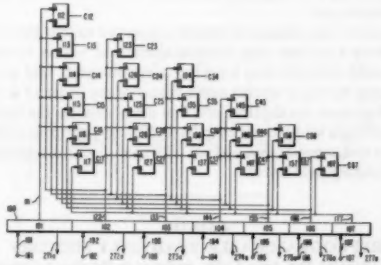
1. An electronic teleprinting apparatus including a removable programmed EPROM and comprising a central processor, a keyboard for entering commands and data for said processor, and a printer controlled by said processor for printing telegraphic messages, said programmed EPROM being recorded with operating routines for said processor, as well as with telegraphic indentification data, wherein the improvement comprises an EPROM programming circuit included in the apparatus and conditionable for programming a fresh EPROM, connecting means adapted to be rendered effective for connecting said fresh EPROM to said programming circuit and for so conditioning said programming circuit, said programming circuit including means controlled by said processor for reading data from said programmed EPROM and for selectively supplementing and selectively modifying the data so read in combination with said data entered from said keyboard in accordance to said commands and data entered from said keyboard, said processor including control means for conditioning said printer to print the data read from said programmed EPROM and the data so supplemented and modified for checking purpose, and command means operable for conditioning said programming circuit to permanently record said supplemented and modified data on said fresh EPROM, whereby the programmed EPROM can be functionally replaced by the fresh EPROM so recorded, and thus may be removed.

4,441,165

REAL-TIME ORDINAL-VALUE FILTERS UTILIZING COMPLETE INTRA-DATA COMPARISONS

Guy B. Coleman, Northridge; James W. Henderson, Woodland Hills, and Jacob M. Sacks, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 28, 1981, Ser. No. 306,251
Int. Cl.³ G06F *7/06*; G06K *9/64*
U.S. Cl. 364—900 **27 Claims**



1. An apparatus for determining which one of a set of R applied data signals is the Mth-largest, this apparatus comprising:

(A) Input Storage Means, for receiving and accessibly storing the subject set of R data signals;

(B) Comparison Means, responsive to these stored data signals,

(1) for comparing each of the R data signals with every other data signal in the set, and

(2) for providing, as the output results of these comparisons, comparison-output signals indicative of the relative magnitude of the compared signals;

(C) Detector Means, responsive to these comparison-output signals,

(1) for testing at least (R-1) selected common-element subsets,

(a) where each of the subsets consists essentially of all comparison-output results obtained from the comparison between a given one of the data signals and each of the other (R-1) data signals, and where the common-data element of each of the at least (R-1) subsets is different from that of any of at least (R-2) other selected subsets,

(b) this testing being so as to determine, for each of at least (R-1) of such subsets, whether the comparison-output signals indicate that the associated common data element is smaller than exactly (M-1) of the other (R-1) data signals, thus making such a signal the desired Mth-largest, and

(2) for generating a detector-output signal indicative of which of the R applied data signals satisfies this (M-1) condition.

4,441,166

PASSIVE ANNIHILATOR FOR CONTIGUOUS-DISK BUBBLE DEVICES

William J. Kabelac, Morgan Hill, and Ian L. Sanders, Sunnyvale, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1982, Ser. No. 381,473
Int. Cl.³ G11C 19/08
U.S. Cl. 365—36 8 Claims

1. A passive annihilator for ion-implanted contiguous-disk bubble devices comprising:

a non-implanted pattern having a plurality of first cusps and forming a propagation path, said first cusps having a first depth, and

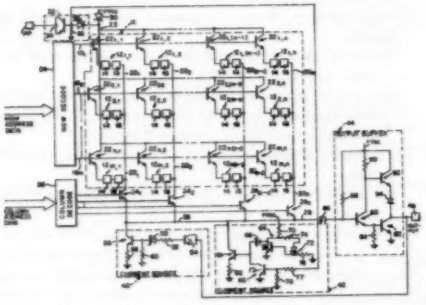
a narrow non-implanted region connected to said pattern to form a second cusp therebetween, said region having a width that provides a poor propagation path, said second cusp having a second depth that is of the order of at least four times the depth of said first cusps wherein the bubbles entering said second cusp have difficulty propagating out of said second cusp, and are collapsed during a subsequent rotating field cycle.

4,441,167

REPROGRAMMABLE READ ONLY MEMORY

Fabio Principi, San Jose, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 3, 1981, Ser. No. 327,144
Int. Cl.³ G11C 17/00
U.S. Cl. 365—94 6 Claims



1. A memory circuit, comprising:

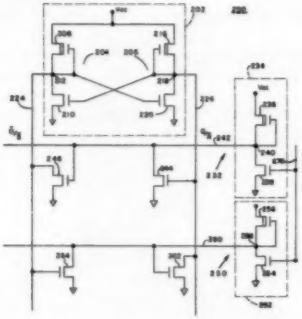
a plurality of addressable non-volatile memory elements each one thereof having a first non-volatile programmable device electrically coupled to a second non-volatile programmable device, the first programmable device having a normally relatively low resistance characteristic which, when programmed, is changed to a relatively high resistance characteristic, and the second programmable device having a normally relatively high resistance characteristic which, when programmed, is changed to a relatively low resistance characteristic.

4,441,168

STORAGE LOGIC/ARRAY (SLA) CIRCUIT

Wolodymyr Luciw, Norristown, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 13, 1982, Ser. No. 339,022
Int. Cl.³ G11C 11/40
U.S. Cl. 365—154 6 Claims



1. A storage logic array circuit comprising:

a column circuit including,

a storage cell having only two terminals for storing a set state and a reset state, said set state being represented by a signal of a first level at a first of said terminals and a signal of a second level at a second of said terminals, and said reset state being represented by a signal of said second level at said first terminal and a signal of said first level at said second terminal, said storage cell including means responsive to a signal of said second level at said first terminal for switching from said set state to said reset state;

first and second column leads connected to said first and second terminals, respectively;

a source providing a continuous reference signal of said second level;

first and second row conductors;

a means for simultaneously applying pulses to said first and second row conductors; and

row circuit means including a first gated transistor connected to said column lead, said first row conductor and said source for connecting said first row conductor to said source when a pulse is applied to said first row conductor and said storage cell is in said set state, and a second gated transistor connected to said second row conductor, said first column lead and said source for connecting said first column lead to said source when a pulse is applied to said second row conductor and said storage cell is in said set state,

whereby said source is connected to said first terminal to switch said storage cell from said set state to said reset state.

4,441,169

STATIC RANDOM ACCESS MEMORY HAVING A READ OUT CONTROL CIRCUIT CONNECTED TO A MEMORY CELL

Itsuo Sasaki, Kawasaki, and Hiroaki Suzuki, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 23, 1982, Ser. No. 351,518
Claims priority, application Japan, Feb. 25, 1981, 56-26361
Int. Cl.³ G11C 11/40, 13/00
U.S. Cl. 365—190 13 Claims

1. A static Random Access Memory comprising:

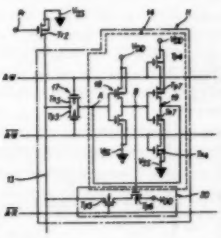
a flip-flop circuit having a first inverter circuit with a first input node and a first output node and a second inverter

circuit with a second input node and second output node, said first output node being connected to the second input node and said second output node being connected to the first input node;

a first power source and an address read line;

a data line having a voltage setting means;

a write-in switching means connected between the data line



and the first input node for forming a memory cell with the flip-flop circuit; and

a read-out control circuit having first and second switching means connected in series between the first power source and the data line, said first switching means controlled by data stored in the memory cell, said second switching means coupled to the address read line and controlled by an address read signal.

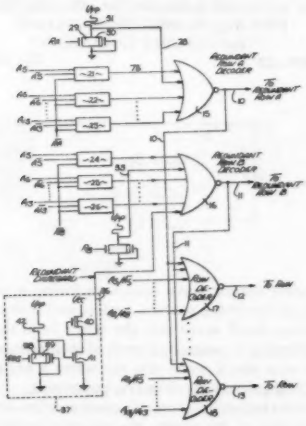
4,441,170
MEMORY REDUNDANCY APPARATUS FOR SINGLE CHIP MEMORIES

Alan C. Folmsbee, Santa Clara; Kim Kokkonen, Campbell, and William J. Spaw, Moss Beach, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 192,494, Sep. 30, 1980, Pat. No. 4,358,833. This application Nov. 12, 1981, Ser. No. 320,600

Int. Cl.³ G11C 7/00

U.S. Cl. 365—200 **17 Claims**



1. In a memory which includes first lines selected by first address signals and second lines selected by second address signals, an improved redundancy apparatus comprising:

a plurality of redundant first lines;

programmable decoder means for selecting said redundant first lines upon receipt of predetermined ones of said first address signals, said decoder means being programmed to recognize said predetermined first address signals and, wherein said decoder means includes fuses which are coupled in series with parallel combinations of two transistors one of which has a threshold voltage of substantially zero volts;

selection means coupled to receive at least a portion of said second address signals for selection of said decoder means during said programming and for disabling programming of said decoder means upon receipt of certain signals;

whereby said memory is programmed to use said redundant lines, and then programmed to prevent inadvertent programming.

4,441,171
MONOLITHICALLY INTEGRATED SEMICONDUCTOR MEMORY

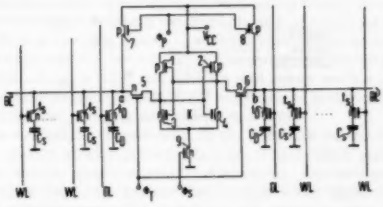
Kurt Hoffmann, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 13, 1982, Ser. No. 339,156

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3101520

Int. Cl.³ G11C 11/24, 7/00

U.S. Cl. 365—205 **6 Claims**



1. Monolithically integrated semiconductor memory, comprising:

a reference potential source, a supply potential source, a matrix of identical one-transistor memory cells disposed in a set of row members and a set of column members, identical comparators constructed in CMOS technology, and comparison cells, one of said comparators and one of said comparison cells being assigned to each of said members of one of said sets;

said comparators each including: a first MOS-field effect transistor of a given first channel conductivity type having a gate electrode controlled by a first clock signal, a first current-carrying terminal connected to said reference potential source, and a second current-carrying terminal, a flip-flop formed of first and second pairs of MOS-field effect transistors each having current-carrying terminals, said transistors of one of said pairs being of the n-channel type and said transistors of the other of said pairs being of the p-channel type, said first pair of transistors having said given channel conductivity type of said first transistor, one of said current-carrying terminals of each of said transistors of said first pair forming a first supply terminal connected to said second current-carrying terminal of said first transistor for receiving reference potential from said reference potential source, one of said current-carrying terminals of each of said transistors of said second pair forming a second supply terminal directly connected to said supply potential source, two second MOS-field effect transistors of a channel conductivity type opposite said given type, each of said second MOS-field effect transistors having gate electrodes controlled by a common second clock signal, first current-carrying terminals connected to said second supply terminal and second current-carrying terminals, two third MOS-field effect transistors each having a gate electrode controlled by a common

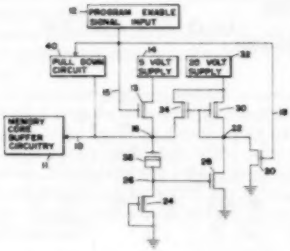
third clock signal, a first current-carrying terminal connected to a respective one of said second current-carrying terminals of said second transistors, and a second current-carrying terminal, and two terminals of said flip-flop for receiving information each being connected to a respective one of said second current-carrying terminals of said third transistors;

said one-transistor memory cells and said comparison cells being connected to said first current-carrying terminals of said third transistors for acting on said comparators.

4,441,172
SEMICONDUCTOR MEMORY CORE PROGRAM CONTROL CIRCUIT

Mark S. Ebel, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 28, 1981, Ser. No. 334,697
Int. Cl.³ G11C 7/00
U.S. Cl. 365—226 **10 Claims**



1. A control circuit for regulating the programming pulse presented to the core of an electrically alterable read-only semiconductor memory, said memory being of the type in which a selected bit is read by introducing a low voltage on a program line from a low voltage supply and said selected bit is programmed by introducing a high voltage on the same program line from a high voltage supply, said control circuit being formed on the semiconductor chip and comprising:

a first circuit node electrically coupled to the program line;

first switching means connected to said first node and adapted for connection to said low voltage supply, operable in response to the reception of a first input signal to connect said first node to the low voltage supply and in response to a second input signal to disconnect said first node from said low supply;

a second circuit node;

second switching means connected to said first node and adapted for connection to said high voltage supply and also controllably coupled to said second node, operable in response to the voltage at said second node to increase the voltage at said first node toward the high voltage of said high voltage supply and thereby produce said programming pulse;

a voltage increasing means connected to said second node, operable in response to the reception of said first input signal to hold said second node at a voltage such that said second switching means does not change the first node voltage and operable in response to the reception of said second input signal to increase the second node voltage;

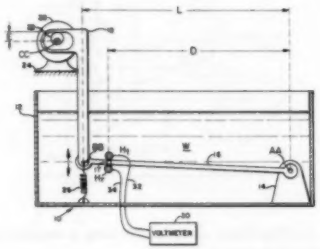
a voltage decreasing means connected to said second node operable in response to a control signal to control the voltage increase on said second node; and

control signal generating means coupled to said first node and to said decreasing means, operable to produce said control signal in response to excessively fast increases in the first node voltage so as to activate said decreasing means.

4,441,173
VERY LOW FREQUENCY HYDROPHONE CALIBRATION

James F. McEachern, State College, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 17, 1982, Ser. No. 358,982
Int. Cl.³ H04R 29/00
U.S. Cl. 367—13 **8 Claims**



1. A system for calibrating a hydrophone in water operable at very low frequencies using a reference hydrophone of known response characteristics, comprising:

an elongated arm pivotal in the water about a substantially horizontal axis;

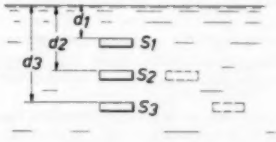
means for mounting the hydrophones in aligned proximity to each other along said arm at substantially the same longitudinal distance from said pivotal axis; and

drive means for moving said arm about its pivotal axis in substantially vertical oscillations so that the hydrophones are subjected to equivalent changes in hydrostatic pressure at the same frequency.

4,441,174
STACKED MARINE SEISMIC SOURCE

Clifford H. Ray, and Neil A. Moore, both of Houston, Tex., assignors to Fairfield Industries, Inc., Houston, Tex.

Filed Aug. 10, 1981, Ser. No. 291,269
Int. Cl.³ G01V 1/36, 1/38
U.S. Cl. 367—23 **17 Claims**



1. A marine seismic wave source, including a plurality of individual gas expansible sources, each of said sources producing a primary shock wave into the water from the location where said source is positioned, each of said sources also producing an after shock wave into the water a predetermined time after said primary shock wave, comprising;

a first of said individual sources located at a first depth below the surface of the water, the negative portion of said primary wave from said first source being separated from the positive portion thereof dependent on the round-trip acoustical travel time of the source impulse to the water surface, the positive portion of the after shock wave therefrom occurring at a time after the primary shock wave dependent on the pressure of the water at said first depth, the negative portion of said after shock wave being separated from its positive portion by the same time separation

that the negative portion of the primary wave is separated from its positive portion,

a second of said individual sources located at a second depth below the surface of the water greater than said first depth, the negative portion of said primary wave from said second source being separated from the positive portion thereof dependent on the round-trip acoustical travel time of the source impulse to the water surface, the positive portion of the after shock wave therefrom occurring at a time after the primary shock wave dependent on the pressure of the water at said second depth, the negative portion of said after shock wave being separated from its positive portion by the same time separation that the negative portion of the primary wave is separated from its positive portion,

the round-trip time for said second source being longer than the round-trip time for said first source, the pressure for said second source being greater than the pressure for said first source, thereby causing the relative time of arrival of said after shock for said second source to be shorter than for said first source,

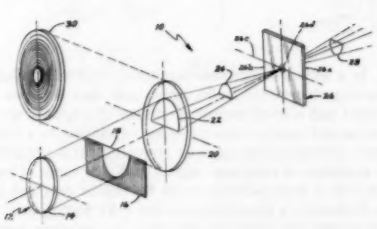
said positive portions of the primary waves from said first and second sources occurring at a location below said second source before the negative portions of the primary waves from said first and second sources occur at said location, said negative portion of the after shock wave from said first source occurring before the positive portion of the after shock wave from said second source occurs at said location, whereby, the primary shock wave energy accumulates in a frequency spectrum range lower than the frequency spectrum for said individual first and second sources.

4,441,175

PARTIAL BEAM FOCUS SENSING IN AN OPTICAL RECORDING SYSTEM

Curtis A. Shuman, Colorado Springs, Colo., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Jan. 25, 1982, Ser. No. 342,459
Int. Cl.³ H04N 5/76; G11B 7/00
U.S. Cl. 369—45 **4 Claims**



1. A partial beam focus sensing system in optical recording comprising:

a Fresnel lens element for receiving a collimated light beam in an optical recording system representative of light reflected from optical recording media and not for receiving any light transmitted to said media,

a centrally symmetric mask element proximate to said lens element for eliminating a portion of said light beam and transmitting a partial light beam, and

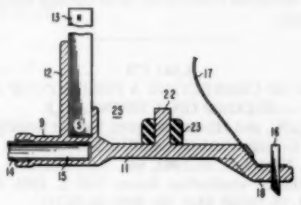
a light detector array comprising at least two light detecting elements matched to said mask element and disposed to receive said partial beam from said lens element.

4,441,176

DAMPING MECHANISM FOR A VIDEO DISC STYLUS HOLDER

Stephen T. Newell, Danville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,643
Int. Cl.³ G11B 3/50
U.S. Cl. 369—170 **13 Claims**



1. In a stylus holder for holding a disc record signal pickup stylus, said holder being of the type having a longitudinal center section separating first and second end sections, said first end section being adapted to receive and secure said pickup stylus, said second end section being adapted for securing the stylus holder to a support arm and said center section exhibiting compliance for limited decoupling of motion of said first end section from the support arm, and wherein said stylus holder has resonant modes at which it is subject to be excited into objectionable mechanical oscillation normal to said longitudinal center section and wherein said center section is mechanically damped to reduce the amplitude of said oscillation, an improved damping apparatus comprising:

an extension perpendicular to the long axis of the center section located between the ends of said center section;

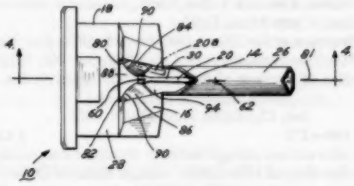
an annular shaped mass circumferentially mounted on said extension, said annular shaped mass being supported by said extension and said longitudinal center section only, to afford vertical compliance to said holder so that said signal pickup stylus reliably tracks said disc record to provide added mass whose inertia tends to maintain said mass in some average position effecting frictional forces which damp said objectionable mechanical oscillation.

4,441,177

STYLUS PROTECTION MECHANISM

Allen R. Groh, Buffalo Grove, and Joseph D. Kehl, Chicago, both of Ill., assignors to Shure Brothers, Inc., Evanston, Ill.

Continuation of Ser. No. 154,087, May 28, 1980, abandoned.
This application Oct. 12, 1982, Ser. No. 433,985
Int. Cl.³ G11B 3/52
U.S. Cl. 369—170 **9 Claims**



1. A phonograph stylus protection mechanism in a stylus assembly having a stylus with a tip and a shank, the stylus being pivotably mounted to the assembly at a pivot point along the shank and being deflectable into and out of operating and non-operating positions by external forces, the mechanism comprising:

a zone defining member on the assembly including limiting surfaces adjacent the operating position and defining a

protective zone for the stylus in which the stylus is protected from external forces; and

means on the assembly for guiding the stylus to the protective zone during lateral deflection of the stylus away from the operating position, the means including angled deflection edges positioned (1) to be physically contacted by the stylus during the lateral deflection and (2) to guide the stylus to the protective zone through the physical contact;

whereby the stylus is protected from damage during lateral deflection.

4,441,178

METHOD OF CORRECTING A POSITION OF A DISK RECORD ON A TURNTABLE

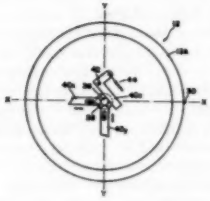
Kozo Kobayashi, and Hiromu Meguro, both of Kodaira, Japan, assignors to Nakamichi Corporation, Tokyo, Japan

Filed Jan. 29, 1982, Ser. No. 343,878

Claims priority, application Japan, Feb. 2, 1981, 56-14081; Feb. 3, 1981, 56-14860; Mar. 10, 1981, 56-34213

Int. Cl.³ G01B *7/00*; G11B *25/04*

U.S. Cl. 369—270 **12 Claims**



1. A method of correcting a position of a record on a turntable comprising the steps of:

tracing a groove of said record by a stylus mounted on a pickup arm so that said pickup arm is angularly displaced in accordance with the eccentricity of said record relative to the rotational center of said turntable;

detecting an angular displacement of said pickup arm while said groove is traced and obtaining eccentric information of said record relative to said rotational center of said turntable; and

correcting said position of said record in accordance with said eccentric information whereby said record on said turntable is placed in a concentric manner relative to said rotational center of said turntable.

4,441,179

OPTICAL VIDEO DISC STRUCTURE

Gary G. Slaten, Fountain Valley, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 3,148, Jan. 15, 1979, Pat. No. 4,310,919. This application Jun. 19, 1981, Ser. No. 322,500

The portion of the term of this patent subsequent to Jan. 12, 1998, has been disclaimed.

Int. Cl.³ G11B *7/24*; H04N *5/85*

U.S. Cl. 369—275 **2 Claims**

2. An information storage member structure comprising:

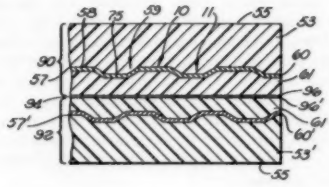
a first disc-shaped information storage member formed of a plastic material having a relatively low resistance to the absorption of moisture and carrying information on an information-bearing surface thereof;

a second disc-shaped information storage member formed of a plastic material having a relatively low resistance to the absorption of moisture and carrying information on an information-bearing surface thereof;

a thin, moisture impervious reflective layer overlying the information-bearing surface of each of said first and second information storage members;

a thin protective layer overlying each of said reflective layers;

each of said first and second information storage members having a thickness greater than the combined thicknesses



of its corresponding reflective layer and protective layer; and

means for joining together said protective layers in facing adjacent relationship, to form said storage member structure.

4,441,180

SERVICE INTEGRATED COMMUNICATION TRANSMISSION AND INTERCHANGE SYSTEM

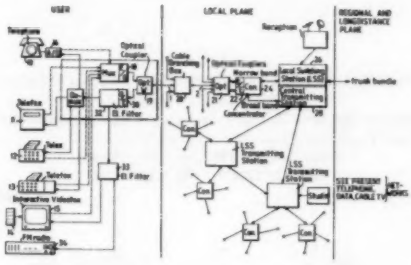
Hans Schüssler, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 30, 1980, Ser. No. 155,132

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922418

Int. Cl.³ H04B *9/00*

U.S. Cl. 370—3 **7 Claims**



1. In a service integrated communications transmission and switching system for audio, video and data between a user terminal and a local switching station of a telephone system wherein said user terminal includes, in addition to a telephone device with an associated code converter for the transmission and reception of telephone signals in digital form, at least one device for a narrowband service for digital data and at least one device for a broadband service with analog data signals such as video or audio broadcasting, and wherein means are provided for connecting said user terminal to said local switching station so that signals may be transmitted in both directions between said user terminal and said local switching station, the improvement wherein: said means for connecting said user terminal to said local station comprises a single light-conductive fiber having one end connected to said user terminal, and a preliminary field concentration means, connected between the other end of said single light-conductive fiber and said local switching station, for connecting signals from and to a plurality of user terminals to said local switching station; said user terminal includes respective means connected to said light-conductive fiber for transmitting and receiving an optical carrier signal modulated with the data to be transmitted via said light-

conductive fiber in wave multiplex duplex operation, with said means for transmitting and receiving an optical signal at said user terminal receiving only a modulated optical signal in a first optical region and transmitting only an optical signal in a second optical region; and said concentrator means includes: first means for coupling signals to be transmitted to said user terminal and decoupling received signals from said user terminal to and from said light-conductive fiber; second means, connected to said first means, for separating analog signals for said broadband services and digital signals for said narrowband and telephone services received from said user terminal into the individual services and for combining analog and digital signals to be transmitted to said user terminal in said first optical region; third means, connected between said second means and said local station, for time multiplexing digital signals for said narrowband and telephone services received from said second means and for transmitting these signals to said local station, and for time demultiplexing digital signals for said narrowband and telephone services received from said local station and supplying the time demultiplexed signals to said second means for transmission to said user terminal; and fourth means, connected to said second means, and for directly establishing a connection for the analog signals for said broadband services between said user terminal and said local station by switching in space multiplex.

4,441,181

OPTICAL WAVELENGTH-DIVISION MULTIPLEX SYSTEM

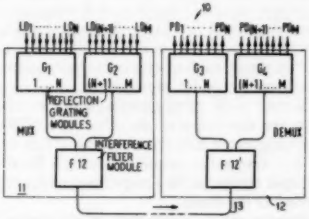
Gerhard Winzer, Munich; Hans Mahlein, and Achim Reichelt, both of Unterhaching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 17, 1981, Ser. No. 303,093

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1980, 3037712

Int. Cl.³ H04J *1/02*

U.S. Cl. 370—3 **16 Claims**



1. In an optical wavelength-division multiplex system with a multiplexer unit, a demultiplexer unit, and means for forming a transmission path between the two units, the improvement comprising both the multiplexer unit and the demultiplexer unit each having a plurality of modules including at least a reflection grating module and an interference filter module, the reflection grating modules and interference filter modules of each unit being matched to one another and each unit having at least one reflection grating module and at least one interference filter module being connected in series in a random sequence.

4,441,182

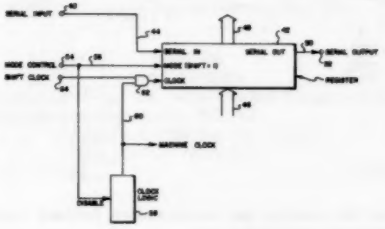
REPETITIOUS LOGIC STATE SIGNAL GENERATION APPARATUS

David W. Best, Marion, and Jeffrey D. Russell, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 15, 1981, Ser. No. 264,178

Int. Cl.³ G06F *11/00, 11/14, 11/22*

U.S. Cl. 371—25 **2 Claims**



1. Apparatus for testing portions of a register based state machine, other than random access memory, which are affected by the clocking of the state machine by using a predefined control bit pattern comprising in combination:

instruction register means including serial control signal input means and serial data output means;

state responsive machine apparatus including said instruction register means;

first means, connected to said instruction register means, for serially loading a predefined control bit pattern into said instruction register means through said serial control signal input means;

second means, connected to said serial control signal input means of said instruction register means, for inhibiting said instruction register means from changing said predefined control bit pattern contained therein until a given test is complete;

third means, including clock means, operating as part of said state machine apparatus for iteratively executing said predefined control bit pattern in said instruction register means through a clocking procedure over a predetermined period of time causing the repetitious execution of logical operations in the remaining portions of said state machine apparatus until said given test is complete;

fourth means, for detecting in said remaining portions of said state machine, the resulting repetitiously occurring signals due to the repeated execution of said predefined control bit pattern in said instruction register by monitoring logic level values and associated lengths of time at each logic level value, said values being continuously altered by the clocking of said clock means until said given test is complete, and wherein said fourth means comprises cyclical input signal detection test equipment having no active part in the operation of said state machine apparatus.

4,441,183

APPARATUS FOR TESTING DIGITAL AND ANALOG CIRCUITS

Jean A. Dussault, Plainsboro, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 22, 1982, Ser. No. 369,302

Int. Cl.³ G06F *31/28*

U.S. Cl. 371—25 **7 Claims**

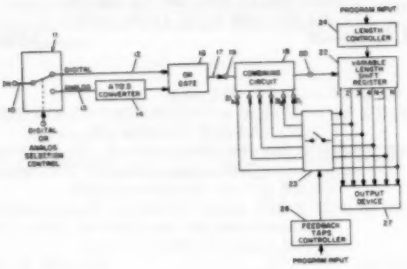
1. Apparatus for testing an electronic circuit comprising:

input means connectable to the electronic circuit under test for receiving data signals characteristic of said circuit;

a shift register having a plurality of successive stages defining an overall register length;

means for selectively varying said overall register length under program control;

means coupling said input means to said shift register including means for combining said data signals with predetermined feedback signals out of said shift register;



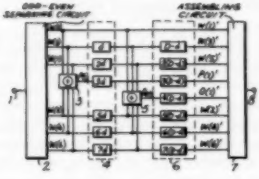
means for selecting said predetermined feedback signals under program control; and

output means coupled to all the stages of said shift register for indicating the status of said circuit under test.

4,441,184
METHOD AND APPARATUS FOR TRANSMITTING A DIGITAL SIGNAL

Takenori Sonoda; Nobuhiko Watanabe, and Masato Tanaka, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 290,850
Claims priority, application Japan, Aug. 12, 1980, 55-110674
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—40 **8 Claims**



1. An encoder for preparing a digital signal for transmission so as to protect against errors occurring as a result of transmission, comprising:

means for receiving said digital signal as a series of successive data words;

separating circuit means for alternately distributing said data words of said series into a first group of sequences of data words and a second group of sequences of data words;

encoder circuit means for providing at least one error correction word sequence, generating elements of which are formed of respective words of said sequence of data words;

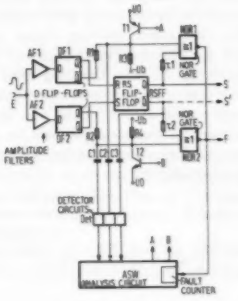
interleaving means imparting different respective delays to said sequences of data words so that the shortest delay time for any word sequence in the second group is longer than the greatest delay time for any word sequence in the first group, and also imparting to said at least one error correction word sequence a delay that is intermediate said greatest delay time of the first group and said shortest delay time of the second group; and

assembly circuit means for forming a series of transmission blocks of the words of the respective data word sequences and said at least one error correction word sequence delayed by their respective delay times.

4,441,185
MONITORING METHOD AND DEVICE FOR A PCM REGENERATOR HAVING A CODE RULE VIOLATION CHECKING DEVICE

Hans G. Jungmeister, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 21, 1981, Ser. No. 285,547
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027735; Jan. 21, 1981, 3101797
Int. Cl.³ G06F *11/30*
U.S. Cl. 371—56 **11 Claims**



1. An arrangement for monitoring a regenerator for pseudo-ternary digital signals of positive and negative input pulses and which produces two amplitude-wise and time-wise regenerated unipolar pulse trains one of which represents the positive input pulses and the other of which represents the negative input pulses, comprising:

an input terminal for receiving the input pulses;

first and second D flip-flops each including a D input, a Q output and a Q output;

amplitude filter means connecting said D inputs to said input terminal and operable to feed the positive input pulses to said first D flip-flop and the negative input pulses to said second D flip-flop;

an RS flip-flop including an S input connected to said Q output of said second D flip-flop, an R input connected to said Q output of said first D flip-flop and Q and Q outputs for providing a push-pull output for the regenerated unipolar pulse trains, each of said pulse trains containing all of the information of the input pulses;

first and second NOR gates each including an output connected to the like output of the other for an OR function for providing error indication signals, a first input connected to a respective output of said RS flip-flop and a second input connected to a respective output of said first and second D flip-flops;

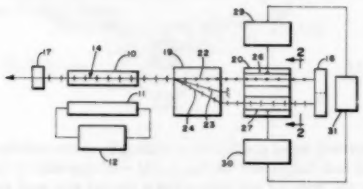
voltage detector means connected to respective selected outputs of said first and second D flip-flops;

an analysis circuit connected to said voltage detector means and to said outputs of said NOR gates, said analysis circuit including two control signal outputs and operable to produce control signals for checking the operation of said NOR gates in response to the voltage detected; and first and second transistors each including a collector-emitter circuit connected between the respective second input of a respective NOR gate and a predetermined potential and a base connected to a respective control signal output of said analysis circuit, and operable in response to the control signals to place said second input at the predetermined potential.

4,441,186
ELECTRONICALLY SWITCHABLE MULTIWAVELENGTH LASER SYSTEM

Edward G. Erickson, Sunnyvale, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 31, 1981, Ser. No. 336,195
Int. Cl.³ H01S 3/10
U.S. Cl. 372—19 **10 Claims**

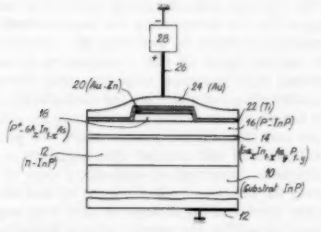


1. A laser system comprising
a lasing medium capable of generating a beam of coherent light having at least two different wavelengths,
means for optically pumping said medium,
first and second optical reflectors optically aligned with and spaced from opposite ends of said medium and defining therebetween an optical cavity of the laser system, one of said reflectors being highly reflective at said two wavelengths, the other of said reflectors being partially transmissive at said two wavelengths whereby to couple an output from said cavity.
a birefringent component and an electrooptically active element in optical alignment with said medium and said one of said reflectors,
said component refracting said beam into orthogonally polarized rays having said first and second wavelengths,
said element having electrode means aligned with said rays and having the property of rotating the polarization of said rays when said electrode means are energized, and
means for selectively energizing said electrode means to inhibit propagation of the ray at said first wavelength and to permit propagation of the ray at said second wavelength whereby the laser oscillates and produces an output at said second wavelength.

4,441,187
A SEMICONDUCTOR LASER LIGHT SOURCE

Jean-Claude Bouley, 35, Avenue du Docteur Durand, 94110 Arcueil; Josette Charil, 61, Avenue Victor Hugo, 92140 Clamart, and Guy Chaminant, 64bis, rue de Paris, 91570 Bievres, all of France

Filed Jul. 15, 1981, Ser. No. 283,631
Claims priority, application France, Jul. 31, 1980, 80 16947
Int. Cl.³ H01S 3/19
U.S. Cl. 372—46 **7 Claims**

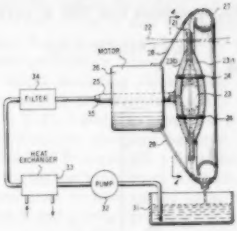


1. A light source with a semiconductor junction comprising a substrate on which are successively deposited a first and second semiconductor layer having opposite doping, a highly doped contact layer partly covered by an alloyed metal layer forming an ohmic contact and a metal layer covering the alloyed layer, together with the remainder of said second semiconductor layer, said metal layer being connected to a power supply, wherein the semiconductor constituting the second layer is chosen from among those which form a Schottky diode in contact with said metal layer, said Schottky diode being reverse polarized under the normal operating conditions of the light source, a charge injection taking place in a zone limited to said single ohmic contact excluding the zones in which there is a Schottky diode.

4,441,188
DYE LASERS

Julian Stone, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 8, 1981, Ser. No. 299,655
Int. Cl.³ H01S 3/20
U.S. Cl. 372—54 **8 Claims**

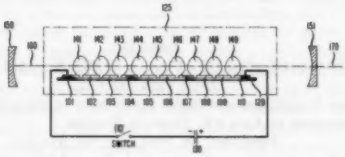


1. In a dye laser (FIGS. 1, 5 or 6) which comprises a pumping laser source (e.g., 11), an optical resonator (e.g., 13–15), and a dye solution flowing through a dye cell (e.g., 12) disposed in the path of the pumping laser light in said resonator, said dye cell being characterized by a pair of closely spaced transparent discs (21), means (26) for spinning said discs at a high rate of speed, a pumping laser light spot being focused on the discs at a predetermined angle, and means (32 and 25) for injecting said dye solution axially with respect to said discs so that a radial flow of the dye solution is caused by the spin force.

4,441,189
FOIL ELECTRODE SPER LIGHT SOURCE

John J. Macklin, Highlands; William T. Silfvast, Holmdel, both of N.J., and Obert R. Wood, II, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 9, 1982, Ser. No. 367,216
Int. Cl.³ H01S 3/097
U.S. Cl. 372—76 **12 Claims**



1. In a recombination light source, apparatus comprising:
excitation means (130) for producing radiation;
said excitation means comprising at least two strips (101–110) having at least one gap, which at least one gap provides at least one intervening discharge path; and

means for applying an electrical pulse to said at least two strips;

at least a portion of said at least two strips being fabricated from a material which is converted into a plasma as a result of the application of said electrical pulse, which plasma cools and recombines to generate said radiation; characterized in that

said portions comprise a material having a figure of merit M much less than unity and are sufficiently thin so that said discharge path occurs only between adjacent ones of said at least two strips.

4,441,190

COUPLING DEVICE FOR ARC FURNACE ELECTRODES

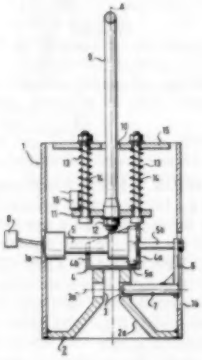
Günther Vielstich, Witten; Hanns-Georg Bauer, Witten-Bommern; Josef Mühlenbeck; Josef Otto, both of Wetter; Horst Feldhoff, Witten; Dieter H. Zöllner, Schwaig b. Nürnberg, and Friedrich Rittmann, Rückersdorf b. Nürnberg, all of Fed. Rep. of Germany, assignors to Arc Technologies Systems Ltd., Grand Cayman, Cayman Islands

Filed Dec. 18, 1981, Ser. No. 332,158

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047620

Int. Cl.³ H05B *7/101*

U.S. Cl. 373—94 **16 Claims**



1. In an arc furnace having at least one arc electrode removably retained within the arc furnace and including a connector element for use in lifting the electrode from the arc furnace employing a lifting appliance, and having a coupling for interconnecting the arc electrode and the lifting appliance, the coupling comprising: a lock configured for detachably engaging the connector element of the arc electrode; a guiding means configured to guide said connector element along an insertion axis into a position for engagement by the lock; and a suspension means interposed between the arc electrode and said lifting appliance including means for shockabsorbing and for accommodating relative motion in a direction parallel to said insertion axis between said suspension means and said lock.

4,441,191

APPARATUS FOR HEATING A CONTINUOUS FLOW OF MOLTEN METAL

Bengt Fredrikson, and Bertil Hans, both of Västerås, Sweden, assignors to Asea AB, Västerås, Sweden

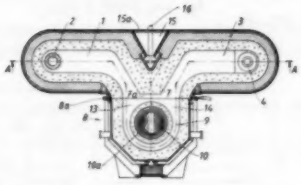
Filed Oct. 14, 1981, Ser. No. 311,442

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1980, 8008136

Int. Cl.³ H05B *5/14*

U.S. Cl. 373—161 **2 Claims**

1. An apparatus for heating a continuous flow of molten metal and comprising a horizontally elongated furnace adapted to contain the flow and having opposite ends of which one is provided with an inlet for the flow and the other end is provided with an outlet for the flow, the furnace having a side wall, the side wall having an opening below the level of the flow in the furnace and an inductor having an induction heating channel connecting with the opening, the inductor and side



wall opening being positioned substantially at the middle of the furnace and the furnace having a side wall opposite to the one having the opening and which has a central side wall portion which inwardly projects horizontally towards the side wall opening and inductor.

4,441,192

SIGNAL PROCESSING SYSTEM HAVING IMPULSE RESPONSE DETECTING CIRCUIT

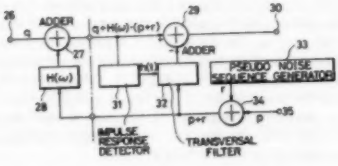
Yasuhiro Kita, Hachioji; Nobuo Tsukamoto, Tachikawa; Masahiro Koya, Kodaira, and Narimichi Maeda, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,229

Claims priority, application Japan, Aug. 29, 1980, 55-118311

Int. Cl.³ H04B *3/04*

U.S. Cl. 375—14 **2 Claims**



1. A signal processing system comprising:

code sequence generating means for generating a selected code sequence including a plurality of coefficients and having a discernible auto-correlation characteristic;

transmission means connected to the output of said generating means for transmitting signals, including said selected code sequence, including a hybrid circuit for coupling a two-wire line to a four-wire output line and for coupling a four-wire input line to said two-wire line, said code sequence generating means being coupled to said four-wire input line;

impulse response detecting means coupled to said four-wire output line for determining the impulse response of said transmission means by detecting the correlation between the output signal of said transmission means and said selected code sequence, including delay means having a plurality of taps at which are fed out a plurality of continuous sample values of said selected code sequence received from said transmission means, means for producing the coefficients of said selected code sequence, a plurality of multipliers connected to said plural taps of said delay means for effecting multiplications of said sample values by the produced coefficients of said code sequence, and means for adding the outputs of said multipliers; and

means coupled to said transmission means for optimizing the transmission waveform of the signals transmitted by said transmission means in response to the output of said impulse response detecting means, including a transversal

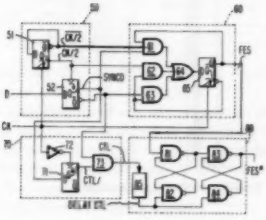
filter connected to be driven by the output of said impulse response detecting means and to be receptive of the signal of said four-wire input line and means for subtracting the output of said filter from the signal of said four-wire output line.

4,441,193

FREQUENCY-ENCODING CIRCUIT FOR REDUCING DISTORTION

John L. Bell, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 3, 1982, Ser. No. 374,506
Int. Cl.³ H04L *27/10*
U.S. Cl. 375—36 **11 Claims**



1. An electronic circuit for generating a modified frequency-encoded signal that is less suceptible to transmission line distortion than a conventional frequency-encoded signal of the type that includes a serial sequence of a relatively low and a relatively high frequency with symmetrical half-cycles, said circuit comprising:

means fo receiving a signal from an external source that is representative of the signal which is to be modified frequency-encoded, and for generating a control signal indicating when a transition occurs in the corresponding conventional frequency-encoded signal from said relatively low to said relatively high frequency; and

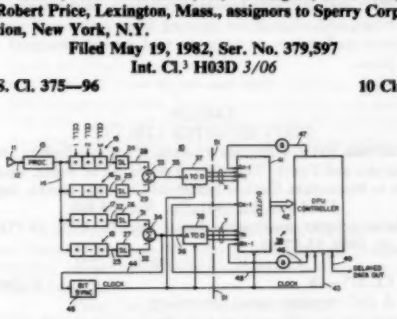
means responsive to said control signal for receiving said corresponding conventional frequency-encoded signal from another external source, and modifying the same such that the duration of the half-cycle that immediately follows said transition is longer than one-half the period of said relatively high frequency by a predetermined amount of time and the duration of the next half-cycle is shorter by a like amount of time.

4,441,194

TRIPLE BIT NON-COHERENT MATCHED FILTER RECEIVING SYSTEM

Samuel C. Kingston, Salt Lake City; Billie M. Spencer, Bountiful; John W. Zscheile, Jr., Farmington, all of Utah, and Robert Price, Lexington, Mass., assignors to Sperry Corporation, New York, N.Y.

Filed May 19, 1982, Ser. No. 379,597
Int. Cl.³ H03D *3/06*
U.S. Cl. 375—96 **10 Claims**



1. A system for refining the non-coherent detection of data bits in a stream of data bits modulated onto a carrier signal, comprising:

means for receiving said data bits,

a plurality of matched filters coupled to said received data bits,

detector means coupled to the outputs of each of said matched filters for providing an absolute value voltage output,

a first summing device coupled to a first predetermined pair of said matched filters for providing a voltage value of a best soft decision of the data bit being detected,

a second summing device coupled to a second predetermined pair of said matched filters for providing a voltage value of a second best soft decision of the data bit being detected,

first and second analog to digital converter means for converting the voltage value outputs of said first and second summing devices to digital values X and Y,

storage means for storing the digital values of X and Y,

storage means for storing the best decision of digital values A of the stream of data bits previously detected,

storage means for storing the second best decision of digital values B of the stream of data bits previously detected,

storage means for storing a digital value D representative of a calculated probability factor, and

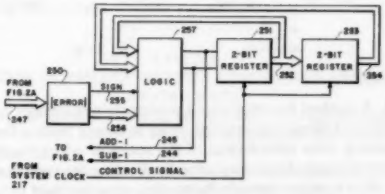
controller means, including clock means and comparison means for making predetermined sets of calculations employing X, Y, D, A and B to provide new digital values of D, A and B and for changing the lower order bits of the values of A and B to provide a final hard decision of the value of the highest order bit of A which is representative of the best hard decision of the value of a bit detected before the X and Y bits were detected.

4,441,195

SHORT TERM RESPONSE ENHANCEMENT FOR DIGITAL PHASE-LOCKED LOOP

David R. Baldwin, and Nicholas S. Lemak, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jul. 10, 1981, Ser. No. 251,846
Int. Cl.³ H03L *7/18*
U.S. Cl. 377—2 **2 Claims**



1. In a phase-locked loop circuit with an enhancement circuit, for producing an output signal having a phase difference which is constant with respect to an input signal, said input signal having a time period subject to fluctuations, said phase-locked loop circuit including a timing element for generating clock pulses, a register element for storing a total number of said clock pulses which occur in a predetermined number of time periods of said input signal to generate a first and a second output signal, said first output signal representative of the average number of said clock pulses which occur in a time period over said predetermined number of time periods of said input signal, and said second output signal representative of a predicted number of said clock pulses which are expected to occur between said output signal and said input signal, a counter element operatively connected to said timing element for counting said clock pulses whereby said counter element contains a value of counter clock pulses, a compare element

operatively connected to said counter element and further operatively connected to said register element, for comparing the value of counted clock pulses to said first output signal to generate said output signal, said output signal operatively coupled to said counter element for resetting said counter element, and a subtractor element operatively coupled to the output terminal of said counter element and further operatively coupled to said register element, for generating a difference signal between the value of counted clock pulses and said second output signal in response to said input signal, said difference signal operatively coupled to said register element, wherein said enhancement circuit comprises:

(a) first means, having an input terminal adapted to receive an error signal, the input terminal of said first means operatively connected to said register element and to said subtractor element, for generating a numeric absolute value of said error signal and an algebraic sign of said error signal; and

(b) logic means, having an input terminal adapted to receive the numeric absolute value of said error signal and the algebraic sign of said error signal, for generating a first signal and a second signal, said first and second signal being operatively coupled to said counter element, wherein the value of the counted clock pulses contained in said counter element is modified in response to said first and second signal.

4,441,196

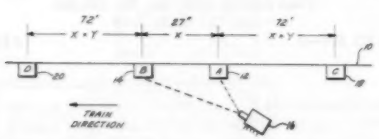
SPEED INDEPENDENT SYSTEM FOR OBTAINING PRESELECTED NUMBERS OF SAMPLES FROM OBJECT MOVING ALONG FIXED PATH

W. Woodward Sanville, Brentwood, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed Feb. 28, 1980, Ser. No. 125,487

Int. Cl.³ G06M *3/02*

U.S. Cl. 377—9 **11 Claims**



1. A method for obtaining a predetermined number of data samples of equal time intervals from an object passing through a sensing zone independent of the speed at which the object passes through the sensing zone by dividing the time in which the object passes through the sensing zone into said predetermined number of equal time intervals regardless of the speed of the object and samping the object during each of the intervals, said method comprising the steps of:

(a) establishing a first reference distance upstream of said sensing zone which is a known multiple of the length of said sensing zone;

(b) measuring the time required for the object to pass through said reference distance;

(c) dividing the aforementioned time by a divisor comprising the product of said known multiple and the predetermined number whereby to obtain a single time interval;

(d) consecutively counting off single time intervals during the time said object passes through the sensing zone; and,

(e) obtaining a data sample from said object during each of said single intervals whereby to obtain said predetermined number of data samples regardless of the speed of the object.

4,441,197

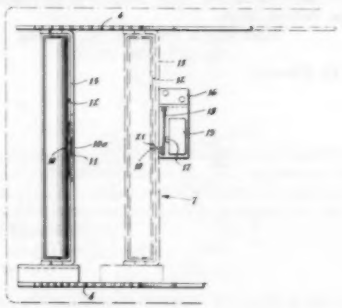
VALUE PRINTING DEVICE WARNING FUNCTION FOR REPLACING AN INKING MEMBER

Danilo P. Baun, Easton, and Alton B. Eckert, Jr., Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,934

Int. Cl.³ G06M *3/02*

U.S. Cl. 377—15 **4 Claims**



1. In a value printing device, a system for automatically indicating to an operator thereof that an inking member therein should be replaced after a fixed number of inking cycles has been run, said system comprising:

(a) first electrical means capable of storing said fixed cycle number and comparing it to the number of cycles actually run at any given time, and which will generate a first electrical impulse when the last cycle of said fixed cycle number has been run;

(b) second electrical means for generating a second electrical impulse when a new inking member has been placed in said device, wherein said second electrical impulse causes said first electrical means to commence a count of inking cycles;

(c) third electrical means automatically activatable by said first electrical means for generating a signal which is sensible to an operator of said printing device when the last inking cycle of said fixed number has been run;

(d) a cartridge having a housing for receiving an inking member, said cartridge housing having an opening therein covered by a pierceable membrane;

(e) piercing means mounted within said value printing device in substantial alignment with said housing opening; and

(f) means for causing relative movement between said cartridge and said piercing means; wherein,

(g) said relative movement causes said piercing means to enter said cartridge housing opening to pierce said membrane, and wherein the piercing force causes said second electrical means to generate said second electrical impulse.

4,441,198

SHIFT REGISTER CIRCUIT

Jun Shibata, Sakai; Haruyasu Yamada, Hirakata; Toshiki Mori, Ibaraki, and Toyoki Takemoto, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 22, 1981, Ser. No. 275,848

Claims priority, application Japan, Jun. 26, 1980, 55-87290; Jun. 26, 1980, 55-87291

Int. Cl.³ G11C *19/28*; H03K *19/173*

U.S. Cl. 377—78 **6 Claims**

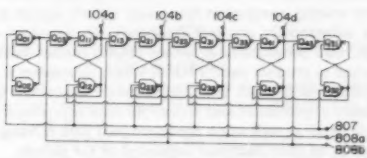
1. A shift register circuit comprising:

means for supplying a pair of clock pulse signals having different phases;

a first flip-flop having an input and an output;

a second flip-flop having first and second inputs and first and second outputs which are 180° out-of-phase, one of said outputs being directly connected to the input of said first flip-flop;

a third flip-flop having first and second inputs and first and second outputs which are 180° out-of-phase, one of said outputs being directly connected to the first input of said second flip-flop;



a first gate coupling the output of said first flip-flop to the second input of said second flip-flop;

a second gate coupling the other of the outputs of said second flip-flop to one of the inputs of said third flip-flop;

said first and second gates being suitably controlled on and off by the different phases of said clock pulse signals; and

said first flip-flop being set and said second and said third flip-flops being reset by a reset signal.

4,441,199

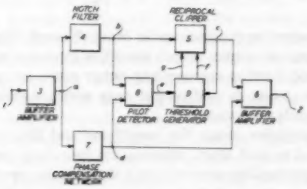
METHOD AND APPARATUS FOR AMPLITUDE LIMITING A COMPOSITE SIGNAL

John K. Chester, 99 Myrtle Ave., Brooklyn, N.Y. 11201; Eric Small, 331 Clinton St., Brooklyn, N.Y. 11231, and Eric D. Stoll, 117 Hillside Ave., Teaneck, N.J. 07666

Filed Jun. 24, 1982, Ser. No. 391,845

Int. Cl.³ H04H 5/00

U.S. Cl. 381—14 **13 Claims**



12. The method of amplitude limiting a composite signal having a narrow-band component without impairing said narrow-band component comprising the steps of:

producing a remainder signal from the composite signal, said remainder signal comprising the composite signal with the narrow-band component substantially removed;

providing a peak signal from said remainder signal, said peak signal comprising peaks in said remainder signal beyond a given amplitude range; and

combining said peak signal and said composite signal to produce an amplitude limited signal whereby said peaks in said peak signal and corresponding peaks in said composite signal substantially cancel and said narrow-band component is substantially unimpaired.

4,441,200

DIGITAL VOICE PROCESSING SYSTEM

Bruce Fette, Mesa; Rose M. Gibson, Phoenix, and Donald P. McCabe, Mesa, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Oct. 8, 1981, Ser. No. 309,640

Int. Cl.³ G10L 1/00

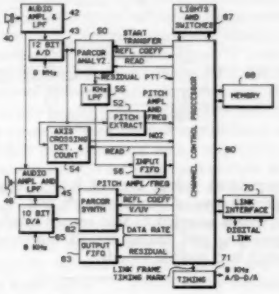
U.S. Cl. 381—36 **10 Claims**

1. A digital voice processing system incorporating a complete vocoder algorithm and including means for converting audio signals to digital electrical signals comprising:

(a) a first integrated circuit semiconductor chip including pitch extraction means connected to receive the digital electrical signals for providing a first plurality of signals representing a plurality of different audio characteristics;

(b) a second integrated circuit semiconductor chip including partial correlation voice analyzer means connected to receive the digital electrical signals for providing a plurality of signals representing a second plurality of different audio characteristics;

(c) a third integrated circuit semiconductor chip including partial correlation audio synthesizer means for receiving a



plurality of signals representing different audio characteristics and synthesizing audio signals therefrom;

(d) transmission and receiving means;

(e) a fourth integrated circuit semiconductor chip including a microprocessor coupled to said transmission and reciving means; and

(f) means coupling the first and second pluralities of signals from said first and second chips to said fourth chip and coupling a plurality of signals representing different audio characteristics from said fourth chip to said third chip for duplex operation, the complete vocoder algorithm being partitioned among the first, second, third and fourth chips so that only low data rate signals are coupled by said coupling means.

4,441,201

SPEECH SYNTHESIS SYSTEM UTILIZING VARIABLE FRAME RATE

Alva E. Henderson, Lubbock, and Richard H. Wiggins, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 118,366, Feb. 4, 1980, abandoned. This application Jan. 25, 1982, Ser. No. 342,311

Int. Cl.³ G10L 1/00

U.S. Cl. 381—51 **18 Claims**

1. A speech synthesis system comprising:

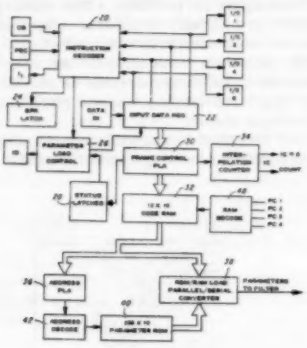
input means for receiving frames of speech data, said frames of speech data comprising binary representations of pitch data, energy data, reflection coefficient data and coded frame rate data, wherein said coded frame rate data is indicative of a variable time interval between the start of a current frame of speech data and the start of the next successive frame of speech data;

decoding means coupled to said input means for decoding said frame rate data;

interpolator means coupled to said input means and to said decoding means for providing a variable number of interpolation calculations to define interpolated speech values between adjacent frames of speech data from last implemented speech data in which the number of interpolation calculations and the time interval between the respective

starts of adjacent frames of speech data in a given instance are determined by said frame rate data;

speech synthesizer means coupled to said interpolator means for selectively converting said frames of speech data and



interpolated values thereof into analog speech signals representative of human speech; and

audio means coupled to said speech synthesizer means for converting said analog signals representative of human speech into audible sounds.

4,441,202
SPEECH PROCESSOR

Yit C. Tong, Burwood; Peter M. Seligman, Essendon; Graeme M. Clark, Eltham; James F. Patrick, North Melbourne, and John B. Millar, Hawker, all of Australia, assignors to The University of Melbourne, Melbourne, Australia

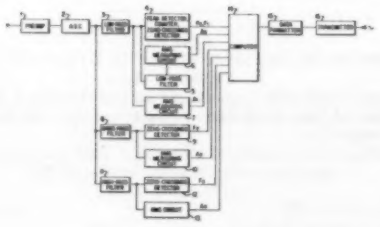
PCT No. PCT/AU80/00016, § 371 Date Jan. 27, 1981, § 102(e) Date Jan. 27, 1981, PCT Pub. No. WO80/02767, PCT Pub. Date Dec. 11, 1980

PCT Filed May 28, 1980, Ser. No. 233,585

Claims priority, application Australia, May 28, 1979, PD8973; Dec. 19, 1979, PE1775

Int. Cl.³ G10L *1/00*; H04R *29/00*

U.S. Cl. 381—68 **19 Claims**



1. A signal processing system for converting a speech signal into a data signal for controlling a hearing prosthesis including an implanted electrode array adapted to stimulate the auditory nerve fibres of a patient by the application of electrical currents to selected electrodes in said array, said processing system comprising means (1,2;20,21) for generating an input signal corresponding to a received speech signal, means (3–6;30–36) for estimating the amplitude and frequency of the fundamental voicing component of said speech signal, means (8–10; 22–26, 27, 28) for estimating the amplitude and frequency of the second formant component of said speech signal, means (14;37) for determining whether said speech signal is voiced or unvoiced, programmable means (14;40) for producing instruction data which in use causes the application of said electrical currents to selected electrodes in said array, said programmable means being programmed with data (FIG. 2) defining a predetermined relationship between each electrode and a selected range of said second formant frequencies based on psychophysical testing of the patient and causing selection of said electrodes based on the estimated frequency of said second formant component such as to produce the desired percepts in the auditory-like sensations generated in the patient, means (14;38) for causing stimulation of said selected electrode at a frequency dependent on the estimated frequency of said fundamental voicing component for voiced speech signals and at a lower substantially constant frequency for unvoiced speech signals, said programmable means (14;40) further being programmed to produce data (FIG. 4) which determines the level of stimulation of each selected electrode dependent on said estimated amplitude of said second formant component of said speech signal as well as on predetermined data relating to the sensitivity of each electrode implanted in the patient.

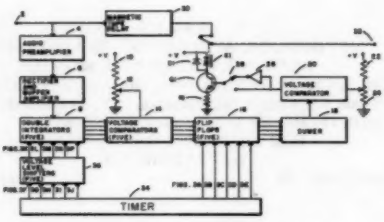
4,441,203
MUSIC SPEECH FILTER

Mark C. Fleming, 145 S. 7th St., Zanesville, Ohio 43701

Filed Mar. 4, 1982, Ser. No. 260,007

Int. Cl.³ G10L *1/04*

U.S. Cl. 381—110 **5 Claims**



1. An automatic programmable Music/Speech filter, having an input and an output, which identifies electrical signals applied to said input as representing either music or speech and selectively passes to said output only music signals or only speech signals comprising:

(a) preamplifier means for amplifying and filtering signals applied to said input, wherein the frequency response of said preamplifier means is such that signals corresponding in frequency to most speech energy are inhibited and signals corresponding in frequency to much music energy are amplified providing amplified audio signals;

(b) rectifier means which rectify said amplified audio signals thus providing pulsating DC signals;

(c) integrator means for integrating said pulsating DC signals, said integrator means comprising two or more cycled integrators;

(d) two or more adjustable comparators which compare the outputs of the cycled integrators to an adjustable reference;

(e) means for storing digital output signals from said comparators;

(f) sumer means which sums the digital signals stored by said means for storing;

(g) a timer which generates sequences of pulses to cycle operation of the integrators and operation of the means for storing;

(h) a signal level comparator which compares the output of the sumer with an adjustable reference and provides a digital control signal identifying the signals applied to said input as representing either music or speech;

(i) means for delaying signals applied to said input;

(j) an audio control circuit responsive to said digital control signal to selectively apply delayed audio signals output by

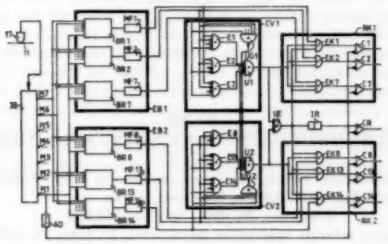
the delaying means to the output of the Music/Speech filter; and

(k) switch means for setting operation of said audio control circuit such that it applies the delayed audio signals to said output exclusively when they have been identified as music or exclusively when they have been identified as speech.

4,441,204
APPARATUS FOR RECOGNITION OF STYLIZED CHARACTERS

Charas Hanna, Belfort, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 2, 1981, Ser. No. 326,702
Claims priority, application France, Dec. 15, 1980, 80 26568
Int. Cl.³ G06K *9/00*
U.S. Cl. 382—7 **13 Claims**



1. Character recognition apparatus for the recognition of stylized characters on a document, wherein the characters to be recognized are a part of a group comprising K different characters, a reading station (17, 18, 20) for reading the characters, driving means (13, 14) to cause a relative displacement between the document and said station, in a direction of displacement permitting each character to pass before said reading station, said station including reading means disposed such that each time a character passes before it, the character is read, and a group of N elementary analogic signals is generated, each resulting from the reading of a respective one of N portions of a character obtained by dividing each character to be read along a direction perpendicular to the direction of displacement;

K operator-generator blocks of logic signals (OG1, OG2, OG3 etc.) to be associated with a respective one of the K characters to be read each of these blocks comprising, on the one hand, N multiplier elements (EM1, EM2, EM3, etc.), each connected to the reading station to receive a respective one of the N elementary analogic signals of a group generated by this station and to multiply this elementary signal by a specific coefficient of said multiplier element;

and a summing element (ES) connected to the N multiplier elements to receive the N elementary signals thus multiplied and delivering at its output a single signal having an amplitude equal to the algebraic sum of the amplitudes of the N multiplied signals, and a generator element for generating a logic circuit connected to said summing element (ES) to receive said single signal, said generator element generating at its output one or the other of two logic signals "1" or "0" in accordance with whether the amplitude of said single signal is positive or not, respectively, the operator-generator blocks being divided in p different assemblies (EB1, EB2), p being a whole number such that:

$$\frac{K}{N} \leq p < \frac{K+N}{N}$$

the specific coefficients of said multiplier elements having a value chosen such that, in response to the reading of a character, the operator-generator block which is associated with this character delivers a logic signal "1", the other operator-generator blocks which appertain to the same assembly as this operator-generator block each delivers a logic signal "0" while, in each of the other assemblies at least two operator-generator blocks each deliver a logic signal "1";

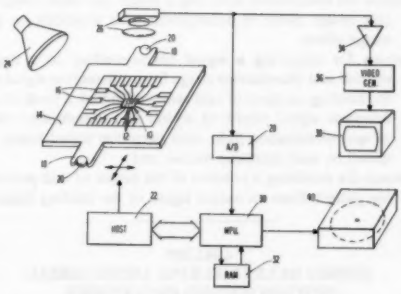
p validation means (CV1, CV2) each associated with a respective one of the p assemblies of operator-generator blocks (EB1, EB2) and each generating in response to the reading of a character, a single validation signal in the case where one only of the operator-generator blocks of the associated assembly delivers a logic signal "1"; and

K character identification elements (EK1, EK2, EK3, etc.) each connected to the output of a respective one of the K operator-generator blocks (OG1, OG2, OG3, etc.), said K identification elements being divided in p different assemblies (RK1, RK2) each associated with a respective one of the p validation means (CV1, CV2), each of these identification elements being connected further to the output of the validation means which is associated with it, and generating a single character recognition signal when it receives at the same time, on the one hand, a validation signal generated by the said validation means, and, on the other hand, a logic signal "1" generated by the operator-generator block to which it is connected.

4,441,205
PATTERN RECOGNITION SYSTEM

George M. Berkin, Yardley, Pa., and Michael Negin, Cinnaminson, N.J., assignors to Kulicke & Soffa Industries, Inc., Horsham, Pa.

Filed May 18, 1981, Ser. No. 264,481
Int. Cl.³ G06K *9/32*
U.S. Cl. 382—8 **37 Claims**



1. A system for comparing groups of digitized data, comprising:

a. means for processing a first group to obtain a first signature representative of a first information portion of said first group of data;

b. means for selecting a set of subsignatures from said signature, said subsignatures representing selected respective portions of said first signature;

c. means for selecting one of the set of said subsignatures which has the maximum relative information content, by successive comparison of the members of said set of subsignatures to said group;

d. means for processing a second group to obtain a second

signature representative of a corresponding first information portion of said second group; and

e. means for comparing said selected subsignature to respective portions of said second signature in order to determine a comparison error for each said portion of said second group, and for designating the respective portion of said second group with respect to which the lowest comparison error is determined, as being the portion of said second group to which said selected subsignature corresponds.

4,441,206

PATTERN DETECTING APPARATUS

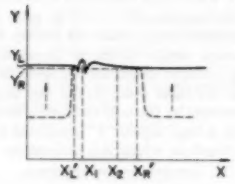
Shinji Kuniyoshi, Tokyo; Akihiro Takanashi, Kokubunji; Toshiei Kurosaki, Tokyo; Sumio Hosaka, Hachioji; Yoshio Kawamura, Tokyo, and Tsuneo Terasawa, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1981, Ser. No. 330,778

Claims priority, application Japan, Dec. 17, 1980, 55-177282

Int. Cl.³ G06K *9/20, 9/00*; H04N *7/00*

U.S. Cl. 382—08 **3 Claims**



1. A pattern detecting apparatus comprising:

means for illuminating a positioning pattern formed on a sample with illumination light;

means for defining a range illuminated with said illumination light, said positioning pattern being illuminated in said range;

means for optically focusing reflected light from said positioning pattern on a predetermined image plane;

means for electrically detecting a bright and dark image on said image plane in accordance with positions on said image plane;

means for removing a signal corresponding to a region outside said illumination range from a detection signal and for holding, in place of said removed signal, a level of said detection signal produced within said illumination range of said illumination light, said detection signal being obtained by said detecting means; and

means for detecting a position of the center of said positioning pattern from an output signal of the holding means.

4,441,207

DESIGN RULE CHECKING USING SERIAL NEIGHBORHOOD PROCESSORS

Robert M. Lougheed, and Trevor N. Mudge, both of Ann Arbor, Mich., assignors to Environmental Research Institute of Michigan and Regents of the University of Michigan, both of Ann Arbor, Mich.

Filed Jan. 19, 1982, Ser. No. 340,609

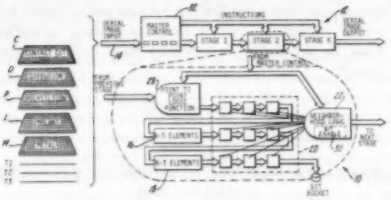
Int. Cl.³ G06K *9/36*

U.S. Cl. 382—8 **10 Claims**

1. A method of checking bit-map representations of an article for compliance with preselected geometrical constraints, said method comprising:

feeding said bit-map in a raster scan line format to an input of a pipeline of serial neighborhood transformation stages;

performing a series of neighborhood transformations in said pipeline to detect regions in the bit-map not complying with said geometrical constraints; and



generating a transformed bit map at the output of the pipeline flagging said detected regions in noncompliance.

4,441,208

PICTURE INFORMATION PROCESSING AND STORING DEVICE

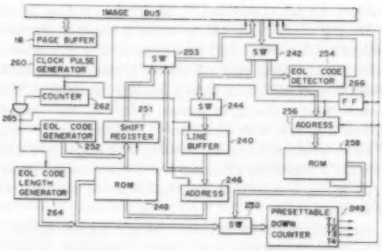
Kazuhiko Iida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 20, 1981, Ser. No. 312,980

Claims priority, application Japan, Oct. 22, 1980, 55-147914

Int. Cl.³ H04N *7/12*

U.S. Cl. 382—56 **5 Claims**



1. A picture information processing and storing device comprising:

first buffer memory means for storing original picture information read out through two-dimensional scanning of an original picture or coded picture information obtained through high efficiency coding of said original picture information;

second buffer memory means;

means for transferring the original picture information stored in said first buffer memory one scanning line after another to said second buffer memory means; and

high efficiency coding means for high efficiency coding the original picture information for one scanning line stored in said second buffer means and storing the coded picture information thus obtained together with a specified code provided at the end thereof in said first buffer memory means in the memory location thereof from which said original picture information for one scanning line has been read out.

4,441,209

PLASTIC BAG COMPRISING VENTING MEANS

Willem Lunshof, De Enschede, and Leonardus H. M. Beukers, Hardenberg, both of Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

Filed Mar. 5, 1982, Ser. No. 355,233

Claims priority, application Netherlands, Mar. 9, 1981, 8101126

Int. Cl.³ B65D *30/24*

U.S. Cl. 383—45 9 Claims

1. A plastic bag with a filling valve and a gas permeable pocket consisting of dust filtering filtering layers (*22a, 22b*) situated at the same bag end as the filling valve (**16**) and forming a gas permeable connection between the inner side of the bag and the outer side of the bag in order to permit gases to escape from the interior of the bag during and after the filling of the bag with filling material, said filtering pockets being at least partially covered by at least one second corner flap part (**12**) and a bottom layer of the bag, the bag being provided with means (**31, 32**) for maintaining the venting capacity of the filtering layer consisting of a disconnectable connection between a corner flap part which partially covers the filtering layer and an opposite portion of the wall of the bag preventing the opposite filtering layers from being pressed upon each other during the filling of the bag.

4,441,210

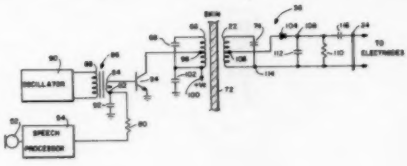
TRANSCUTANEOUS SIGNAL TRANSMISSION SYSTEM AND METHODS

Erwin S. Hochmair, and Ingeborg J. Hochmair, both of A-1130 Wien Jaunerstrasse 27, Vienna, Austria

Filed Sep. 18, 1981, Ser. No. 303,590

Int. Cl.³ H04B *5/00;* H04R *25/00*

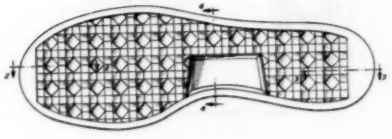
U.S. Cl. 455—41 11 Claims



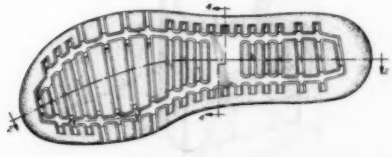
4. A transcutaneous signal transmission system in which auditory signals are transmitted from a transmitter means outside of a patient to a receiver means implanted in the patient characterized by a first tuned circuit of said transmitter means and a second tuned circuit of said receiver means being positioned to achieve essentially critical coupling with optimal displacement tolerance of said first and second tuned circuits.

273,244
ATHLETIC SHOE
Edward J. Norton, Kingston; Paul Oparowski, Derry, and Alphonse L. Belavitch, Salem, all of N.H., assignors to New Balance Athletic Shoe, Inc., Boston, Mass.
Filed Jun. 4, 1982, Ser. No. 384,940
U.S. Cl. D2—310

273,245
SHOE OUTSOLE
Raymond Tonkel, Exeter, N.H., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 29, 1982, Ser. No. 344,009
U.S. Cl. D2—320

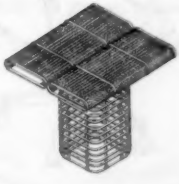


273,246
SHOE OUTSOLE
Raymond Tonkel, Exeter, N.H., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 29, 1982, Ser. No. 344,010
U.S. Cl. D2—320



273,247
BELT ATTACHABLE INSULATED HOLDER FOR A BEVERAGE CAN
James M. Pigott, 1711 N. Trinity, San Antonio, Tex. 78208
Filed Dec. 18, 1981, Ser. No. 332,229
U.S. Cl. D2—400

273,248
CONVERTIBLE TABLE OR SIMILAR ARTICLE
Edward Secon, Trumbull, Conn., assignor to The Sherwood Corporation, Spring City, Tenn.
Filed Oct. 2, 1981, Ser. No. 307,743
U.S. Cl. D6—3

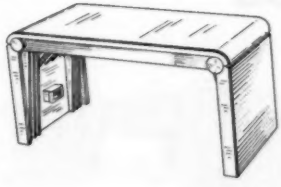


273,249
CHAIR
Donald C. Petitt, 207 W. 86th St., New York, N.Y. 10024
Filed Nov. 10, 1981, Ser. No. 320,040
U.S. Cl. D6—30

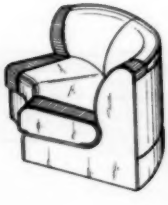
273,250
ARM CHAIR
Donald C. Petitt, 207 W. 86th St., New York, N.Y. 10024
Filed Nov. 9, 1981, Ser. No. 319,548
The portion of the term of this patent subsequent to Feb. 28, 1998, has been disclaimed.
U.S. Cl. D6—31

273,251
ARM CHAIR
Donald C. Petitt, 207 W. 86th St., New York, N.Y. 10024
Filed Nov. 10, 1981, Ser. No. 320,041
The portion of the term of this patent subsequent to Feb. 28, 1998, has been disclaimed.
U.S. Cl. D6—31

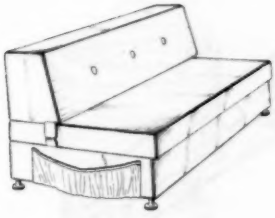
273,252
FOOTSTOOL
Morley Markson, Toronto, Canada, assignor to Yorkvest Limited, Toronto, Canada
Filed Mar. 29, 1982, Ser. No. 363,312
Claims priority, application Canada, Oct. 30, 1981, 30-10-81-3
U.S. Cl. D6—32



273,253
CLOSED CURVED SOFA
Barbara Dubbin, and Jackie Caputo, both of Miami, Fla., assignors to Casa Bella Imports, Inc., Miami, Fla.
Filed Jan. 8, 1982, Ser. No. 338,127
U.S. Cl. D6—61



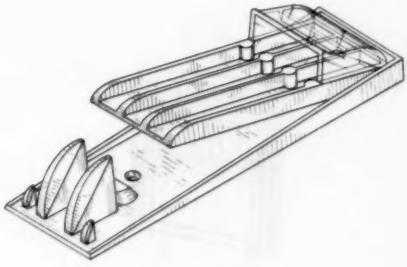
273,254
CONVERTIBLE SOFA
Igal Fairaizen, 58 Eilat Rd., Tel Aviv, Israel
Filed Feb. 13, 1981, Ser. No. 234,554
U.S. Cl. D6—64



273,255
SHEET DISPLAY STAND
Cory Marcus, 455 Powell St., San Francisco, Calif. 94102
Filed Aug. 3, 1981, Ser. No. 289,272
U.S. Cl. D6—85

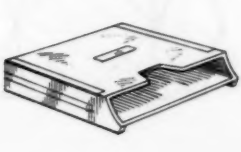
273,256
FRAME FOR A SHEET DISPLAY STAND
Cory Marcus, 455 Powell St., San Francisco, Calif. 94102
Filed Aug. 3, 1981, Ser. No. 289,273
U.S. Cl. D6—85

273,257
COMBINED TOOTHPASTE DISPENSER AND TOOTHBRUSH HOLDER
Gilbert E. Barrera, 11354 Vance Jackson, San Antonio, Tex. 78230
Filed Jul. 22, 1981, Ser. No. 285,865
U.S. Cl. D6—87



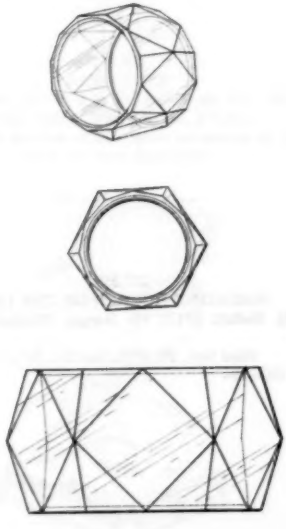
273,258
BUD VASE
William R. Richmond, Shelbyville, Ind., assignor to Williams Industries, Inc., Shelbyville, Ind.
Filed Mar. 8, 1982, Ser. No. 355,902
U.S. Cl. D6—137

273,259
MAGAZINE HOLDER OR THE LIKE
Teresa G. Gullett, 27132 Via Burgos, Mission Viejo, Calif. 92691
Filed Nov. 27, 1981, Ser. No. 325,271
U.S. Cl. D6—184

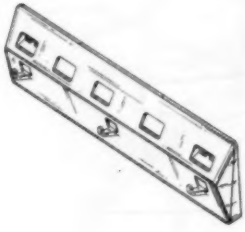


273,260
COMBINED HEADBOARD AND HUTCH UNIT
William P. Kemp, III, Goldsboro, and Clarence R. Duncan, Jr., Greensboro, both of N.C., assignors to Kemp Furniture Industries, Inc., Goldsboro, N.C.
Filed Mar. 7, 1983, Ser. No. 473,114
U.S. Cl. D6—198

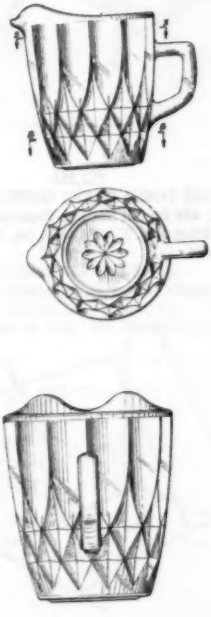
273,261
NAPKIN RING
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002
Filed Jul. 27, 1981, Ser. No. 286,861
U.S. Cl. D7—72



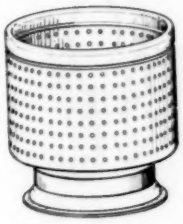
273,262
RACK FOR UTENSILS OR THE LIKE
Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jan. 12, 1982, Ser. No. 338,948
U.S. Cl. D7—74



273,263
CREAM PITCHER OR SIMILAR ARTICLE
James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. D140,180, Apr. 14, 1980, Pat No. 267,697.
This application Apr. 30, 1982, Ser. No. 393,026
U.S. Cl. D7—319

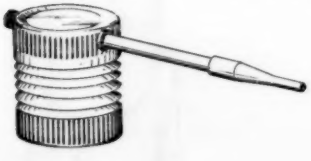


273,264
FIRE PIT OR THE LIKE
Murray L. Elliston, 7064 Hillsboro St., San Diego, Calif. 92120
Filed Aug. 26, 1981, Ser. No. 296,980
U.S. Cl. D7—332



273,265
FEEDER TUBE FOR PLANT INJECTION DEVICE
Dale I. Dodds, Pasadena, Calif., assignor to J. J. Mauget Co., Burbank, Calif.
Filed Sep. 14, 1981, Ser. No. 301,939
U.S. Cl. D8—1

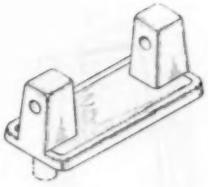
273,266
PESTICIDE DUSTER
Anthony J. Souza, Lancaster, Pa., assignor to Woodstream Corporation, Lititz, Pa.
Filed Nov. 30, 1981, Ser. No. 325,631
U.S. Cl. D8—2



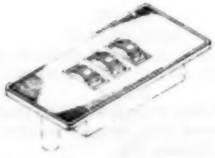
273,267
MULTI-PURPOSE STOVE TOOL
Paul B. Bortz, North Ferrisburg, Vt., assignor to Vermont Stove Co., Inc., Shelburne, Vt.
Filed Nov. 30, 1981, Ser. No. 325,962
U.S. Cl. D8—14

273,268
HAND GRIP FOR TORQUE APPLYING TOOLS
Lloyd T. Smith, Newton, Kans., assignor to Fiskars Manufacturing Corporation, Wausau, Wis.
Filed Nov. 16, 1981, Ser. No. 321,675
U.S. Cl. D8—83

273,269
HANDLE STUD FOR AN ARTICLE OF LUGGAGE OR THE LIKE
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock, Inc., Garfield, N.J.
Division of Ser. No. 233,637, Feb. 12, 1981. This application Jun. 8, 1983, Ser. No. 502,249
U.S. Cl. D8—321



273,270
CONTROL PANEL ASSEMBLY FOR A COMBINATION LOCK AND THE LIKE
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock, Inc., Garfield, N.J.
Division of Ser. No. 219,957, Dec. 24, 1980. This application Mar. 28, 1983, Ser. No. 479,320
U.S. Cl. D8—341

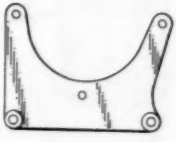


273,271
CONTROL PANEL ASSEMBLY FOR A COMBINATION LOCK AND THE LIKE
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock, Inc., Garfield, N.J.
Division of Ser. No. 219,957, Dec. 24, 1980. This application Mar. 28, 1983, Ser. No. 479,319
U.S. Cl. D8—341

273,272
SHOWER CURTAIN HOLDER
Evelyn Roeser, Corapolis, Pa.
Filed Jul. 9, 1981, Ser. No. 281,862
U.S. Cl. D8—367

273,273
SAFETY HOOK
Christian Faidide, Maringues, France, assignor to S.A.R.L. Wichard, Thiers, France
Filed Jul. 14, 1981, Ser. No. 283,294
Claims priority, application France, Jan. 14, 1981, 810118
U.S. Cl. D8—367

273,274
BRACKET FOR AUTOMOBILE AIR CONDITIONING COMPRESSOR
Shelton E. Taylor, 4112 Oakellar St., Tampa, Fla. 33611
Filed May 13, 1981, Ser. No. 263,159
U.S. Cl. D8—380



273,275
DESIGN FOR COMBINED BOTTLE AND CAP
Beverly L. Markis, Boston, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 23, 1981, Ser. No. 334,031
U.S. Cl. D9—381

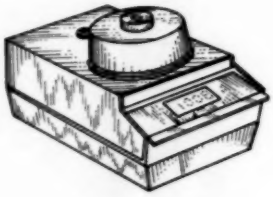
273,276
WINE BOTTLE
Matthew J. Klim, New Hartford, Conn., assignor to Matthew Klim Associates, Inc., Avon, Conn.
Filed Apr. 17, 1981, Ser. No. 255,259
U.S. Cl. D9—383

273,277
PACKAGING CONTAINER FOR A DOLL
Steven Strauss, Scarsdale, N.Y., assignor to Eugene Doll & Novelty Co., Inc., New York, N.Y.
Filed Jun. 8, 1981, Ser. No. 271,140
U.S. Cl. D9—415

273,278
CONTAINER HANDLE OR SIMILAR ARTICLE
Thomas H. Hayes, Westport, Conn., assignor to Ethyl Corporation, Richmond, Va.
Filed Jun. 3, 1981, Ser. No. 269,541
The portion of the term of this patent subsequent to Dec. 2, 1994, has been disclaimed.
U.S. Cl. D9—434

273,279
CLOCK
Stephen E. Drummond, 5252 Bixby Rd., Canal Winchester, Ohio 43110
Filed Jul. 1, 1981, Ser. No. 280,771
U.S. Cl. D10—1

273,280
ELECTRONIC BALANCE
Richard B. Haigh, Buchanan, and Philip M. Parker, Stevensville, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.
Filed Mar. 2, 1981, Ser. No. 239,680
U.S. Cl. D10—91



273,281
ROAD HAZARD MARKER
Jerrold Mihailoff, 12 Cottonwood Dr., Don Mills, Ontario M3C 2B4, Canada
Continuation-in-part of Ser. No. 929,206, Jul. 28, 1978, Pat. No. Des. 260,742. This application Jun. 19, 1980, Ser. No. 161,206
Claims priority, application Canada, Feb. 3, 1978, 0302787
U.S. Cl. D10—109

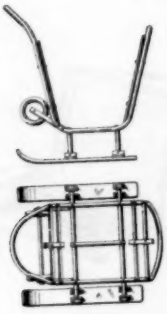
273,282
BELT RING
Joseph B. Matt, 464 Pine, Wyandotte, Mich. 48192
Filed Jun. 10, 1981, Ser. No. 272,322
U.S. Cl. D11—30

273,283
RING
Marina Bulgari, Athens, Greece, assignor to Zoidia Anstalt (NOW) Marina B Creation S.A., Vaduz, Liechtenstein
Filed Feb. 26, 1981, Ser. No. 238,578
Claims priority, application Italy, Sep. 2, 1980, 35977 B/80
U.S. Cl. D11—34

273,284
PENDANT
Andrea A. E. Szabo, 1626 Wentwood Dr., Pasadena, Tex. 77504
Filed Dec. 17, 1981, Ser. No. 331,543
U.S. Cl. D11—45

273,285
CREAMER AND SUGAR BOWL SIMULATING THIMBLE SET
William B. Shane, and Claudia A. Shane, both of 2845 N. Albany, Chicago, Ill. 60614
Filed Jan. 18, 1982, Ser. No. 340,314
U.S. Cl. D11—157

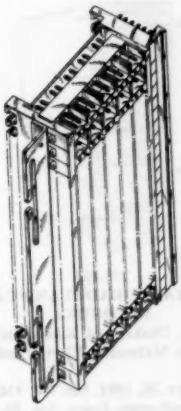
273,286
WOOD HAULER
William A. Jacobsen, F1691 Hwy. yF, Minocqua, Wis. 54548
Filed Oct. 22, 1981, Ser. No. 313,724
U.S. Cl. D12—6



273,287
UNICYCLE
Joseph M. Evans, 4506 Garden Dr., Baltimore, Md. 21215
Filed Aug. 13, 1981, Ser. No. 292,616
U.S. Cl. D12—107

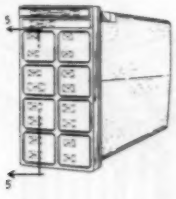
273,288
MOTORCYCLE WINDSHIELD
Stanley A. Johnson, Brookfield, Wis., assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.
Filed Dec. 29, 1982, Ser. No. 454,494
U.S. Cl. D12—182

273,289
TELEPHONE CONNECTOR BLOCK
Thomas A. Hollfelder, Huntington, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed Mar. 6, 1981, Ser. No. 241,109
U.S. Cl. D13—24



273,290
TELEPHONE CONNECTOR BLOCK
Thomas A. Hollfelder, Huntington, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed Mar. 6, 1981, Ser. No. 241,110
U.S. Cl. D13—24

273,291
DIGITAL LOGIC MODULE FOR MOUNTING IN A CONTROL PANEL
Thomas R. Bean, Concord Township; Edward F. Stockmaster, Mentor, and George S. Whaley, Eastlake, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Apr. 30, 1980, Ser. No. 258,981
U.S. Cl. D13—40

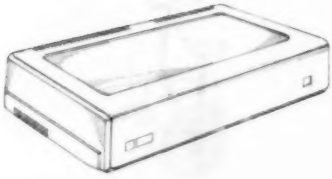


273,292
COMBINED PORTABLE RADIO AND CASSETTE TAPE RECORDER
Teruyuki Nishimoto, Osaka, and Kikuo Ohta, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 28, 1981, Ser. No. 316,026
Claims priority, application Japan, Apr. 30, 1981, 56-18948
U.S. Cl. D14—5

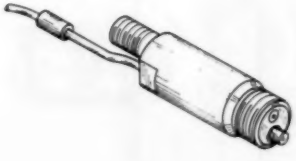
273,293
TELEPHONE FACE PLATE
Harry R. Rasmussen, Tacoma, Wash., assignor to Crest Industries, Inc., Puyallup, Wash.
Filed Jun. 4, 1981, Ser. No. 270,576
U.S. Cl. D14—66

273,294
DIRECTORY TERMINAL
Michel Moraine, Boersch, France, assignor to La Telephonie Industrielle et Commerciale, Strasbourg, France
Filed Feb. 27, 1981, Ser. No. 239,037
Claims priority, application France, Aug. 29, 1980, 80 2725
U.S. Cl. D14—101

273,295
HARD DISK DRIVE
James R. Stewart, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Filed Nov. 19, 1981, Ser. No. 322,922
U.S. Cl. D14—109



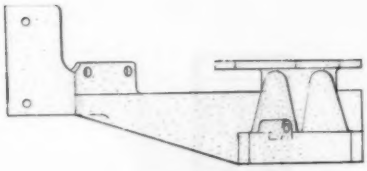
273,296
COMBINED FUEL INJECTOR AND THERMAL HEATER
Monte M. Dilliner, Lineville, Iowa, assignor to Oscar E. Jones; Ted Lowe, both of Des Moines, Iowa and Robert H. Robinson, Fairfield, Ill., a part interest
Filed Jun. 4, 1981, Ser. No. 270,230
U.S. Cl. D15—05

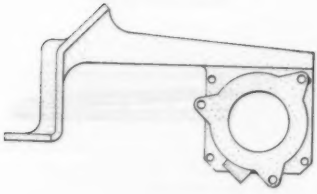


273,297
BRACKET FOR SUPPORTING A LOW PRESSURE GAS CONVERTER

Robert L. Nolff, Romulus, Mich., assignor to Propane Carburetion Company, Inc., Romulus, Mich.

Filed Jan. 4, 1982, Ser. No. 336,831
U.S. Cl. D15—5

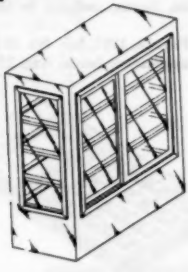




273,298
BEVERAGE COOLER

Arthur W. Trulske, Frontenac, Mo., assignor to True Manufacturing Co., Inc., O'Fallon, Mo.

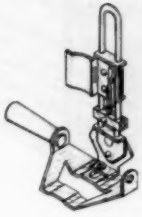
Filed Mar. 23, 1981, Ser. No. 246,244
The portion of the term of this patent subsequent to Jul. 6, 1996, has been disclaimed.
U.S. Cl. D15—81



273,299
ADJUSTABLE PORTABLE HAND DRILL PRESS HOLDER

Joseph R. Archeskie, 402 Miracle La., Chambersburg, Pa. 17201

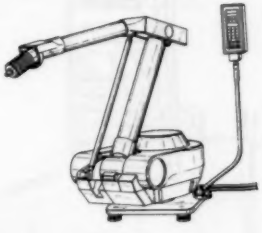
Filed May 29, 1981, Ser. No. 268,269
U.S. Cl. D15—132



273,300
ROBOT FOR AUTOMATIC PAINT SPRAYING OR THE LIKE

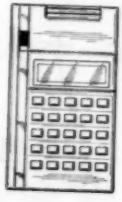
Ole Molaug, Jernbanegt. 4, 4340 Bryne, Norway

Filed Dec. 22, 1981, Ser. No. 333,289
Claims priority, application Norway, Jun. 24, 1981, 62079
U.S. Cl. D15—199



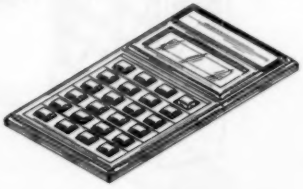
273,301
ELECTRONIC CALCULATOR WITH SOLAR BATTERIES
Masaji Sawada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 14, 1981, Ser. No. 330,229
U.S. Cl. D18—7

273,302
ELECTRONIC CALCULATOR
Masaji Sawada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 14, 1981, Ser. No. 330,232
Claims priority, application Japan, Jun. 26, 1981, 56-28312
U.S. Cl. D18—7

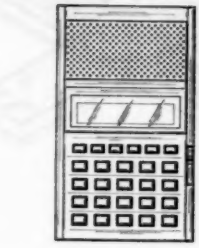


273,303
ELECTRONIC CALCULATOR
Harumi Sakamoto, Osaki, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 14, 1981, Ser. No. 330,233
Claims priority, application Japan, Jun. 26, 1981, 56-28313
U.S. Cl. D18—7

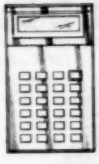
273,304
ELECTRONIC CALCULATOR
Keiji Sakata, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Feb. 24, 1982, Ser. No. 351,663
Claims priority, application Japan, Aug. 25, 1981, 56-37883
U.S. Cl. D18—7



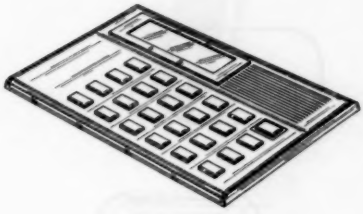
273,305
ELECTRONIC CALCULATOR
Shigeru Kurozumi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 21, 1982, Ser. No. 370,461
Claims priority, application Japan, Oct. 23, 1981, 56-47307
U.S. Cl. D18—7



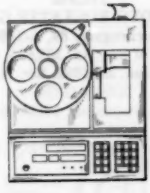
273,306
ELECTRONIC CALCULATOR
Masafumi Yamagami, and Keiji Sakata, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 18, 1982, Ser. No. 389,990
Claims priority, application Japan, Dec. 26, 1981, 56-58608
U.S. Cl. D18—7

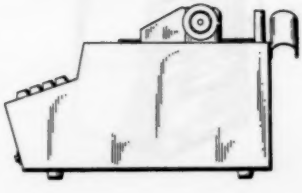


273,307
ELECTRONIC CALCULATOR
Masafumi Yamagami, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 18, 1982, Ser. No. 389,989
Claims priority, application Japan, Dec. 26, 1981, 56-58609
U.S. Cl. D18—7

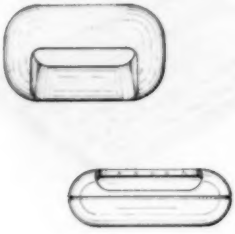


273,308
TAG PRINTING MACHINE
Yasuhiko Matsuda, and Kouichi Konda, both of Iwate, Japan, assignors to Kabushiki Kaisha Sato, Japan
Filed Nov. 19, 1981, Ser. No. 322,870
Claims priority, application Japan, Jul. 15, 1981, 56-30813
U.S. Cl. D18—13

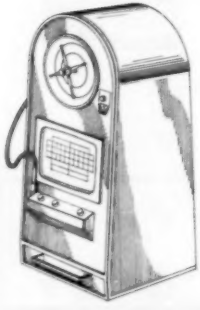




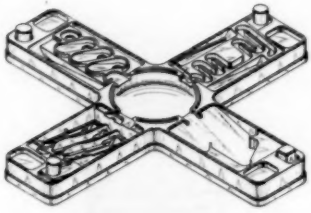
273,309
PAPER CLIP HOLDER
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed Sep. 25, 1981, Ser. No. 305,518
U.S. Cl. D19—75

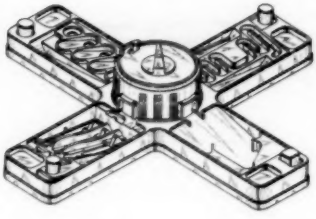


273,310
ELECTRONIC VIDEO ROULETTE GAME HOUSING
Christian Pohanka, Buchengasse 89, A-1100 Vienna, Austria
Continuation-in-part of Ser. No. 305,695, Sep. 25, 1981. This application Jan. 22, 1982, Ser. No. 341,878
U.S. Cl. D21—13

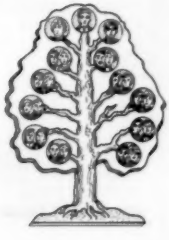


273,311
BALL TRANSFERING GAME BOARD
Masaaki Yoshimura, Tokyo, Japan, and Hitoshi Itakura, Torrance, Calif., assignors to Tomy Kogyo Co., Inc., Japan
Filed May 14, 1981, Ser. No. 263,498
Claims priority, application Japan, Nov. 20, 1980, 55-48576
U.S. Cl. D21—19





273,312
AMERICAN FAMILY TREE GAME PANEL OR SIMILAR ARTICLE
Joseph G. Guertin, 233 Benedict Rd., Pittsfield, Mass. 01201
Filed Jun. 22, 1981, Ser. No. 267,513
U.S. Cl. D21—25



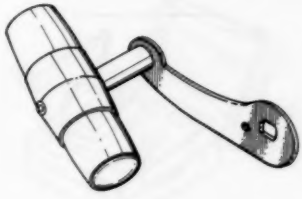
273,313
BLEEDING MONSTER TOY FIGURE
Ivan G. Callais, Jr., 3413 Bissonet Dr., Metairie, La. 70002
Filed Jun. 11, 1981, Ser. No. 272,726
U.S. Cl. D21—166

273,314
HANDLE FOR PHYSICAL EXERCISER OR SIMILAR ARTICLE
Kenneth H. McCoy, 3107-17th St., Santa Monica, Calif. 90405, and John Romain, 1629 Veteran Ave., Los Angeles, Calif. 90024
Filed Feb. 12, 1981, Ser. No. 233,633
U.S. Cl. D21—191

273,315
POOL CUE CHALK CONTAINER
Dale R. Matteson, West Allis, Wis., assignor to Pro Chalker, Inc., West Allis, Wis.
Filed Mar. 30, 1982, Ser. No. 363,541
U.S. Cl. D21—232

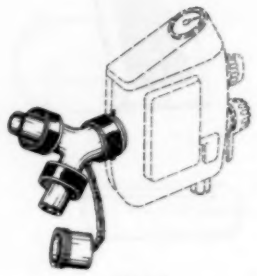
273,316
PISTOL GRIP
Lonnie B. Lambert, P.O. Box 29404, San Antonio, Tex. 78229
Filed Mar. 15, 1982, Ser. No. 357,995
U.S. Cl. D22—1

273,317
HANDLE FOR FISHING REEL
William Purcell, Philadelphia, Pa., assignor to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa.
Filed Mar. 12, 1982, Ser. No. 357,627
U.S. Cl. D22—25

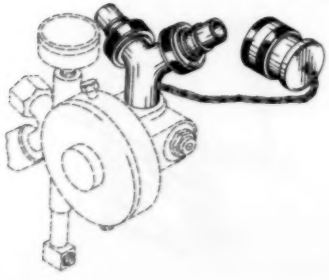


273,318
FISH LURE
Thomas A. Abberger, 19171 Greenacre Rd., South Bend, Ind. 46637
Filed Jan. 22, 1982, Ser. No. 341,814
U.S. Cl. D22—27

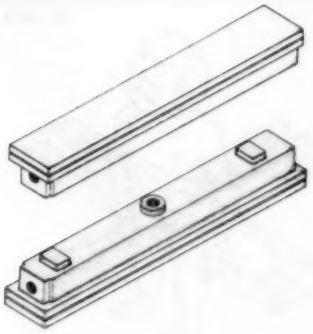
273,319
CONNECTOR FOR AIR-BREATHING APPARATUS
Glen R. Mattingly, 950 E. Lockwood St., and Joseph A. Quintanares, 650 W. 1st Pl., both of Mesa, Ariz. 85201
Filed Feb. 23, 1981, Ser. No. 236,751
U.S. Cl. D23—40



273,320
CONNECTOR FOR AIR-BREATHING APPARATUS
Glen R. Mattingly, 950 E. Lockwood St., and Joseph A. Quintanares, 650 W. 1st Pl., both of Mesa, Ariz. 85201
Filed Feb. 23, 1981, Ser. No. 236,752
U.S. Cl. D23—40

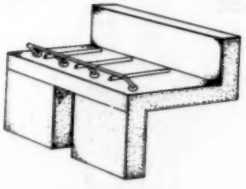


273,321
GAS PIPE TYPE FIREPLACE LOG LIGHTER
John A. Cosper, P.O. Box 5325, Birmingham, Ala. 35207
Filed Dec. 17, 1981, Ser. No. 331,559
U.S. Cl. D23—90.1

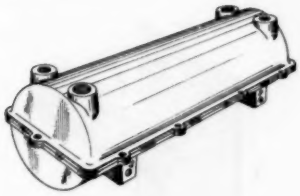


273,322
STOVE FOR BURNING COAL OR WOOD
Norman Fleisler, Laval, Canada, assignor to Powrmatic du Canada LTEE/Powrmatic of Canada Ltd., Terrebonne, Canada
Filed Mar. 31, 1982, Ser. No. 363,667
U.S. Cl. D23—97

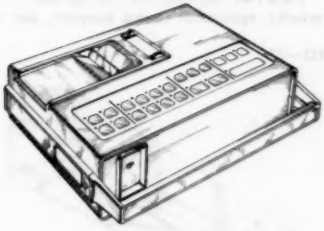
273,323
FIREPLACE HEAT EXCHANGER
Keith J. Davidson, Dorchester, Canada, assignor to 432698 Ontario Ltd., Dorchester, Canada
Filed Aug. 7, 1981, Ser. No. 290,834
Claims priority, application Canada, Feb. 9, 1981, 09-02-81-5
U.S. Cl. D23—135



273,324
HEAT EXCHANGER HOUSING
Jerome E. Brownlee, Inglis, Fla., assignor to Dallas Fuel Laboratories, Inc., Marianna, Fla.
Filed Apr. 13, 1981, Ser. No. 253,699
U.S. Cl. D23—136



273,325
ELECTROCARDIOGRAPH
Claude Macquignon, Lake Peekskill, N.Y., assignor to Cambridge Instruments, Inc., Ossining, N.Y.
Filed Mar. 4, 1981, Ser. No. 240,570
U.S. Cl. D24—17

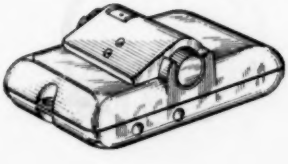


273,326
SURGICAL INSTRUMENT FOR GUIDING A DRILL BIT FOR DRILLING THROUGH BONE SECTIONS
Lars G. B. Peterson, Gothenburg, and Gerhard Schneider, Älta, both of Sweden, assignors to AB Stille-Werner, Stockholm, Sweden
Filed Aug. 10, 1981, Ser. No. 291,380
Claims priority, application Sweden, Feb. 27, 1981, 810517
U.S. Cl. D24—27

273,327
CONTAINER FOR A HYPODERMIC NEEDLE DISPOSAL DEVICE
Esperanto J. Simicich, 4673 S. Friday Cir., Cocoa, Fla. 32922
Filed Dec. 29, 1980, Ser. No. 221,037
U.S. Cl. D24—29

273,328
PORTABLE ELECTRONIC FACIAL AND HAND MUSCLE TONER
Amy Hastings, Santa Ana, and Douglas Patton, Irvine, both of Calif., assignors to Firm-A-Face, Inc., New York, N.Y.
Filed Apr. 6, 1981, Ser. No. 251,212
U.S. Cl. D24—41

273,329
HOUSING FOR A TRANSCUTANEOUS ELECTRONIC NERVE STIMULATOR
Richard L. Walus, Norwell, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.
Filed Aug. 7, 1981, Ser. No. 290,916
U.S. Cl. D24—41

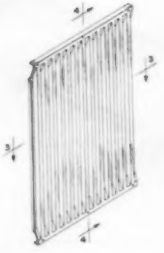


273,330
MEDICAL FLUID FILTER
Ellen A. Rouch, Gurnee, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Sep. 28, 1981, Ser. No. 306,619
U.S. Cl. D24—51

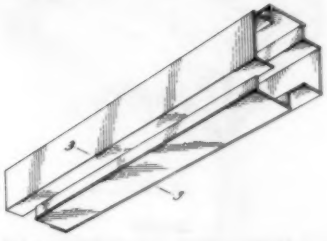
273,331
LUMBO-SACRAL ORTHOSIS
Robert Gruber, Cincinnati, Ohio, assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio
Filed Feb. 10, 1982, Ser. No. 347,516
U.S. Cl. D24—64

273,332
RESTAURANT BUILDING
James V. Tedesco, 1045 N. Azusa Ave., Space 12-A, Covina, Calif. 91722
Filed May 22, 1981, Ser. No. 266,193
U.S. Cl. D25—10

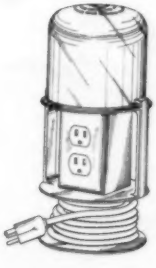
273,333
FENCE PANEL OR THE LIKE
Stanley C. Wilder, 7920 Buford, Dallas, Tex. 75241
Filed Jul. 6, 1981, Ser. No. 280,306
U.S. Cl. D25—38



273,334
BEAM
George B. A. Young, Sturmer, Nr. Haverhill, England, assignor to Acrow (Engineers) Limited, London, England
Filed Nov. 20, 1981, Ser. No. 323,449
Claims priority, application United Kingdom, Jun. 8, 1981, 1000862
U.S. Cl. D25—73



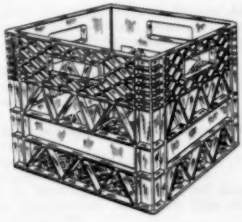
273,335
COMBINED LAMP AND POWERBOARD
Francis R. Bannigan, 64 Duerdin St., North Clayton, Victoria, 3168, Australia
Filed Jan. 22, 1981, Ser. No. 227,206
U.S. Cl. D26—51



273,336
TWO SIDED ABRADING MIT WITH DUAL SOAP COMPARTMENTS FOR FACE AND BODY USE
Aaron Zutler, 22 Stauber Dr., Plainview, N.Y. 11803
Filed Sep. 7, 1982, Ser. No. 415,736
U.S. Cl. D28—63

273,337
DOCUMENT CART
Joseph K. Semerjian, Franklin Park, and James P. Crowley, Glenview, both of Ill., assignors to Wilson Jones Company, Chicago, Ill.
Filed May 27, 1981, Ser. No. 267,433
U.S. Cl. D34—21

273,338
CRATE
Howard M. Walton, Don Mills, Canada, assignor to Piper Industries, Inc., Memphis, Tenn.
Filed Jul. 9, 1981, Ser. No. 281,651
U.S. Cl. D34—43



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF APRIL, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Bradford, Marion M.; Orthoefer, Frank T.; and Wright, Kenneth N., 4,440,792, Cl. 426-271.000.

A. H. Robins Company, Inc.: *See*—
Walsh, David A., 4,440,785, Cl. 424-317.000.

A/S Niro Atomizer: *See*—
Lunghofer, Eugene P.; Mortensen, Sten; and Ward, Aubrey P., 4,440,866, Cl. 501-127.000.

Abbott Laboratories: *See*—
DeBernardis, John F.; and Winn, Martin, 4,440,769, Cl. 424-251.000.
Zomorodi, Mostafa; and Trieber, Alan J., 4,440,815, Cl. 428-35.000.

Abel, Edward P.: *See*—
Bailey, David B.; and Abel, Edward P., 4,440,848, Cl. 430-215.000.

Abermeth, Hubert; Deckert, Andreas; Muller, Helmut; and Wahnschaffe, Jurgen, to Klockner-Humboldt-Deutz Aktiengesellschaft. Braking device for a valve controlled internal combustion engine. 4,440,126, Cl. 123-321.000.

Abouchar, John W.; and Doyle, Michael J. Mass flow meter with reduced attitude sensitivity. 4,440,021, Cl. 73-204.000.

ACF Industries, Incorporated: *See*—
Behle, Gunter R.; and Hillstead, David P., 4,440,379, Cl. 251-144.000.
Behle, Gunter R.; and Hrinsin, John A., 4,440,380, Cl. 251-144.000.

Achelpohl, Fritz, to Windmoller & Holscher. Apparatus for forming stacks ready to be packaged from flat workpieces. 4,440,386, Cl. 271-70.000.

Achille, Jean R., to Illinois Tool Works Inc. Integrally formed resilient clip and extension. 4,440,374, Cl. 248-544.000.

Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Hydraulic system for a vehicle. 4,440,453, Cl. 303-50.000.

Adams, Gary E., to International Business Machines Corp. Gas chromatograph, Fourier transform, infrared spectroscopy system. 4,440,013, Cl. 73-23.100.

Adams, Jack C., to Energy Recovery Group, Inc. Waste material incineration system and method. 4,440,098, Cl. 110-215.000.

Adams, Jeffry D.: *See*—
Gerace, Michael J.; and Adams, Jeffry D., 4,440,829, Cl. 428-343.000.

Adamski, Joseph R.: *See*—
Teich, Wesley W.; Freedman, George; and Adamski, Joseph R., 4,441,002, Cl. 219-10.55B.

Adamson, Jerome E. Ski pole grip with electrical heating. 4,440,421, Cl. 280-821.000.

Adamson, Ronald B.: *See*—
Cheng, Bo-Ching; and Adamson, Ronald B., 4,440,862, Cl. 436-6.000.

Adrian Marsh Limited: *See*—
Knight, Peter E., 4,440,298, Cl. 206-216.000.

Aeritalia Societa Aerospaziale Italiana p.A.: *See*—
D'Apuzzo, Sebastiano, 4,440,532, Cl. 408-229.000.

Aerofoam Industries (Proprietary) Limited: *See*—
Blackwood-Murray, Thomas J.; and Evans, David, 4,440,295, Cl. 198-843.000.

Agarwal, Suresh C., to Babcock & Wilcox Company, The. Detection of hot and cold spots in chemical reactors. 4,440,509, Cl. 374-166.000.

Agfa-Gevaert AG: *See*—
Linke, Gerda; Engelsmann, Dieter; Maas, Dieter; Bassler, Alfred; and Hackenberg, Hubert, 4,440,483, Cl. 354-212.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Gartner, Joachim; and Gartner, Eberhard, 4,440,106, Cl. 118-640.000.
Krafft, Werner, 4,440,849, Cl. 430-239.000.

Ahlin, Lars, to Timmele Laminering AB. Means for an elastic body with protective layer. 4,440,817, Cl. 428-71.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Adachi, Yoshiharu, 4,440,453, Cl. 303-50.000.

Aizawa, Bunji: *See*—
Amano, Kazunori; Aizawa, Bunji; Ibe, Akio; and Sekikawa, Yoichi, 4,440,147, Cl. 126-201.000.

Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, to Sony Corporation. Noise reduction circuit. 4,441,083, Cl. 330-149.000.

Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, to Sony Corporation. Noise reduction circuit. 4,441,084, Cl. 330-149.000.

Akamine, Takenori: *See*—
Miyano, Ryuzo; Uenishi, Haruyuki; Akatani, Hisashi; and Akamine, Takenori, 4,441,001, Cl. 200-308.000.

Akashi, Kazuo: *See*—
Nakamura, Teruo; Kiyoto, Michio; Akashi, Kazuo; and Hasegawa, Isao, 4,440,560, Cl. 71-24.000.

Akatani, Hisashi: *See*—
Miyano, Ryuzo; Uenishi, Haruyuki; Akatani, Hisashi; and Akamine, Takenori, 4,441,001, Cl. 200-308.000.

Akatsu, Yosuke: *See*—
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yosuke, 4,440,254, Cl. 180-140.000.

Akiyama, Hiroyuki; Hirosawa, Kuninori; and Kuwabara, Hideki, to Japan Styrene Paper Corporation. Process for producing foamed and molded article of polypropylene resin. 4,440,703, Cl. 264-50.000.

Akkerman, Neil H., to AVA International Corporation. Well slip assemblies. 4,440,223, Cl. 166-217.000.

Aksamit, Frank J. Chain saw sharpener. 4,440,045, Cl. 76-25.00A.

Aktiebolaget Bofors: *See*—
Broberg, Hans, 4,440,595, Cl. 159-13.00A.
Hallstrom, Stig, 4,440,360, Cl. 244-3.280.

Aktiebolaget SAMEFA: *See*—
Bergstrom, Hans R.; and Malmborg, Rolf, 4,440,495, Cl. 356-155.000.

Akzo NV: *See*—
Gerlach, Klaus; Lange, Wolfgang; and Loh, Dieter, 4,440,648, Cl. 210-759.000.
Ostertag, Karl, 4,440,641, Cl. 210-321.300.

Alan Shelton Limited: *See*—
Shelton, William E. A.; and Corby, David C., 4,440,353, Cl. 242-47.010.

Albanesi, Giancarlo; and Rinaldi, Gianfranco, to Saffa S.p.A. Process for stabilizing by encapsulation red phosphorus to be used as flame retardant of polymeric materials and product so obtained. 4,440,880, Cl. 523-205.000.

Albertinsky, Boris I.; Dmitrieva, Nina M.; Evseev, Anatoly K.; Zotov, Ivan P.; Ivanov, Andrei S.; Sviniin, Mikhail P.; Suslov, Valentin A.; and Fedotov, Mikhail T. High-voltage rectifier unit. 4,441,150, Cl. 363-126.000.

Albright & Wilson Limited: *See*—
Mather, Douglas E.; Messenger, Edward T.; and Phillips, Brinley M., 4,440,665, Cl. 252-356.000.

Aldinger, Fritz: *See*—
Bussard, Adrien; Aldinger, Fritz; and Sperner, Franz, 4,440,178, Cl. 128-784.000.

Alitalia Linee Aeree Italiane S.p.A.: *See*—
Spagnoli, Giulio, 4,440,265, Cl. 182-129.000.

Allan, Kenneth N.; Worringer, Thomas J.; and Baugh, Robert T., to Allis-Chalmers Corporation. Sling belt bulk material conveyor. 4,440,293, Cl. 198-813.000.

Allcock, Harry R.; Neenan, Thomas X.; and Kossa, Walter C., to Research Corporation. Coupling of polyorganophosphazenes to carboxylic acid. 4,440,921, Cl. 528-168.000.

Allen, J. Warren: *See*—
Lilley, George M., 4,440,636, Cl. 209-10.000.

Allen, James O. Fuel treating apparatus for internal combustion engines and method of operating same. 4,440,115, Cl. 123-1.00A.

Allen, William: *See*—
Cheh, Ernest; and Allen, William, 4,439,919, Cl. 29-861.000.

Alles, Alfred H. Building module having internal tubes for carrying electrical wires. 4,439,966, Cl. 52-221.000.

Allied Corporation: *See*—
Ivory, Dawn M.; Miller, Granville G.; Chance, Ronald R.; and Baughman, Ray H., 4,440,669, Cl. 252-518.000.
Kwon, Young D.; Kavesh, Sheldon; and Prevorsek, Dusan C., 4,440,711, Cl. 264-185.000.
Libowitz, George G.; Lynch, James F.; and Maeland, Arnulf J., 4,440,737, Cl. 423-644.000.
Maeland, Arnulf J.; Libowitz, George G.; and Rak, George, 4,440,736, Cl. 423-644.000.

Allied Gator, Inc.: *See*—
Ramun, Michael; and Ramun, John, 4,439,921, Cl. 30-134.000.

Allis-Chalmers Corporation: *See*—
Allan, Kenneth N.; Worringer, Thomas J.; and Baugh, Robert T., 4,440,293, Cl. 198-813.000.
Novotny, Carl F., 4,440,351, Cl. 241-41.000.

Allison, Debra L.: *See*—
Doherty, James B.; Dorn, Conrad P.; Witzel, Bruce E.; Allison, Debra L.; and Shen, Tsung-Ying, 4,440,779, Cl. 424-274.000.

Alltrade, Inc.: *See*—
Hillinger, George, 4,440,205, Cl. 145-2.00R.

Alps Electric Co., Ltd.: *See*—
Fujisawa, Kyuichi, 4,441,109, Cl. 346-139.00R.

Alt, Gerhard H.: *See*—
Chupp, John P.; Alt, Gerhard H.; and Balthazor, Terry M., 4,440,964, Cl. 568-30.000.

Altenpohl, Paul J., to W. F. Altenpohl, Inc. Severed poultry neck selection system. 4,439,892, Cl. 17-52.000.

Altier, Anthony L. Booster springs for coil spring trap. 4,439,946, Cl. 43-81.000.
Aluminum Company of America: *See*—
Dawless, Robert K.; LaCamera, Alfred F.; and Klingensmith, Chester H., 4,440,610, Cl. 204-67.000.
Powers, John H.; and Dang, Hang T., 4,440,606, Cl. 204-33.000.
AM General Corp.: *See*—
Goodell, Fred L.; and Ellison, Michael J., 4,440,451, Cl. 301-105.00R.
AM International, Inc.: *See*—
Whittemore, Jesse E., Jr., 4,440,847, Cl. 430-146.000.
Amano, Kazunori; Aizawa, Bunji; Ibe, Akio; and Sekikawa, Yoichi, to Toshiba Netsukiga Kabushiki Kaisha; and Shin Foa Koeki Kabushiki Kaisha. Room-heating stove with a retractable fire-prevention spacer. 4,440,147, Cl. 126-201.000.
Ambe, Satoshi: *See*—
Ikezawa, Kenji; Takao, Hiroshi; Ambe, Satoshi; and Uchida, Masaaki, 4,439,911, Cl. 29-570.000.
Ambros, Rainer; Brenner, Norbert; and Fischer, Jurgen, to Rheinisch-Westfalisches Elektrizitatswerk AG. Method of and apparatus for the treatment of radioactive waste water from nuclear power plants. 4,440,673, Cl. 252-632.000.
Ambrose, Arnum: *See*—
Fogelman, H. Frank; and Ambrose, Arnum, 4,440,457, Cl. 312-7.200.
AMCEC Corporation: *See*—
Girard, Maurice V.; Worrall, Michael J.; and Seguy, Bernard R., 4,440,549, Cl. 55-59.000.
American Analytic Technology, Inc.: *See*—
Masreliez, Carl J., 4,441,013, Cl. 219-231.000.
American Cyanamid Company: *See*—
Shepherd, Robert G., 4,440,940, Cl. 560-19.000.
Upeslacis, Janis; Schaub, Robert E.; and Bernstein, Seymour, 4,440,758, Cl. 424-180.000.
American Home Products Corporation: *See*—
Sarantakis, Dimitrios, 4,440,904, Cl. 525-54.110.
American Hospital Supply Corporation: *See*—
Intengan, Franklin S., 4,440,301, Cl. 206-456.000.
American Microsystems, Inc.: *See*—
Haque, Yusuf A., 4,441,082, Cl. 330-129.000.
American Optical Corporation: *See*—
Chu, Nori Y. C., 4,440,672, Cl. 252-586.000.
American Photo-Graphics Corporation: *See*—
Edhlund, Ronald D., 4,440,842, Cl. 430-11.000.
Ames, Jack D.; and Smith, David W., to Mead Corporation, The. Sheet registration device. 4,440,389, Cl. 271-251.000.
AMF Inc.: *See*—
Engelder, Paul D., 4,440,219, Cl. 166-57.000.
Garofalo, Giovanni, 4,441,142, Cl. 362-158.000.
AMP Incorporated: *See*—
Desmarais, Mark R., 4,440,992, Cl. 200-340.000.
Schumacher, William L., 4,440,469, Cl. 350-96.200.
Ampex Corporation: *See*—
Ryan, Dennis M.; and Hursey, Robert, 4,440,358, Cl. 242-189.000.
Anders, Edward O. Method and apparatus for drilling a well bore. 4,440,241, Cl. 175-61.000.
Anderson, Carl J., to International Business Machines Corporation. Stripline cable with reduced crosstalk. 4,441,088, Cl. 333-1.000.
Anderson, Catherine A.: *See*—
Anderson, Stephen T.; and Anderson, Catherine A., 4,440,177, Cl. 128-719.000.
Anderson Cornelius Company, The: *See*—
Anderson, Terry M., 4,440,066, Cl. 91-459.000.
Anderson, David F., to United States of America, Energy. Wide range radioactive gas concentration detector. 4,441,024, Cl. 250-380.000.
Anderson, Gary B., to Antroy Enterprises, Inc. Device for controlling a circuit. 4,441,097, Cl. 340-365.00A.
Anderson, Stephen T.; and Anderson, Catherine A., to Medical Graphics Corporation. Respiratory analyzer system. 4,440,177, Cl. 128-719.000.
Anderson, Terry M., to Anderson Cornelius Company, The. Digital pneumatic modulator. 4,440,066, Cl. 91-459.000.
Ando, Takao: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,440,757, Cl. 424-180.000.
Anelva Corporation: *See*—
Suzuki, Toshiyuki; and Nakamura, Kazuo, 4,440,618, Cl. 204-298.000.
Anestos, Themistocles C.: *See*—
Sickles, James E.; and Anestos, Themistocles C., 4,440,349, Cl. 239-698.000.
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of 6-methyl-$\Delta^{4,6}$-3-keto steroids. 4,440,684, Cl. 260-239.570.
Antkowiak, Russell J., to Aqua Culture, Inc. Tracking means for moving a light source across a planter surface to simulate sunlight. 4,441,145, Cl. 362-384.000.
Antroy Enterprises, Inc.: *See*—
Anderson, Gary B., 4,441,097, Cl. 340-365.00A.
Aono, Tetsuya: *See*—
Kuzuna, Seiji; Kishimoto, Shoji; and Aono, Tetsuya, 4,440,691, Cl. 260-429.900.
Aoshima, Terutaka: *See*—
Oota, Hiroyuki; Aoshima, Terutaka; Yamamori, Kenji; and Narita, Ryuho, 4,441,016, Cl. 219-441.000.
Appenzeller, Valentin, to Kusters, Eduard. Support rod steamer rod lock. 4,440,335, Cl. 226-107.000.
Aqua Culture, Inc.: *See*—
Antkowiak, Russell J., 4,441,145, Cl. 362-384.000.
Aquila, Werner: *See*—
Sauer, Wolfgang; Aquila, Werner; Hoffmann, Wolfgang; Brenner, Karl; and Halbritter, Klaus, 4,440,960, Cl. 568-471.000.
Arai, Yoshio: *See*—
Kataoka, Hiroyuki; and Arai, Yoshio, 4,440,513, Cl. 400-165.100.
Arakawa, Hiroshi: *See*—
Suzuki, Hajime; Suzuki; and Arakawa, Hiroshi, 4,440,198, Cl. 139-435.000.
Aralis, Frank M.: *See*—
Van Vliet, James G.; and Aralis, Frank M., 4,441,105, Cl. 340-750.000.
Arc Technologies Systems Ltd.: *See*—
Vielstich, Gunther; Bauer, Hanns-Georg; Muhlenbeck, Josef; Otto, Josef; Feldhoff, Horst; Zollner, Dieter; et al.; and Rittmann, Friedrich, 4,441,190, Cl. 373-94.000.
Arena, Alan J.: *See*—
Pounder, Edwin; Arena, Alan J.; Pawlowski, Michael; and Totten, Adrian M., 4,440,030, Cl. 73-861.870.
Arichi, Isao; Waniisi, Tetuya; and Koh, Takuji, to Omron Tateisi Electronics Co. Electronic timer. 4,440,503, Cl. 368-107.000.
Arikata, Kazuyoshi: *See*—
Takeshige, Kenji; Hirabe, Kenji; Ogawa, Yukifumi; Arikata, Kazuyoshi; Yako, Kazunori; Sakai, Kenichi; Matsuo, Toshinori; and Kamio, Hiroshi, 4,440,584, Cl. 148-128.000.
Ariki, Yutaka: *See*—
Katsumi, Ikuo; Kondo, Hideo; Yamashita, Katsuji; Hidaka, Takayoshi; Hosoe, Kazunori; Ariki, Yutaka; Yamashita, Toshiaki; and Watanabe, Kiyoshi, 4,440,784, Cl. 424-308.000.
Arita, Setsuo: *See*—
Sato, Takao; Ito, Tetsuo; and Arita, Setsuo, 4,440,715, Cl. 376-210.000.
Arlt, Dieter, to Bayer Aktiengesellschaft. Preparation of substituted alpha-halogeno-propionic acids and their derivatives. 4,440,947, Cl. 560-226.000.
Arlt, Dieter: *See*—
Jautelat, Manfred; and Arlt, Dieter, 4,440,955, Cl. 568-419.000.
Armstrong World Industries, Inc.: *See*—
Lyall, Joseph G., 4,440,080, Cl. 101-129.000.
Witman, Jack H., 4,440,826, Cl. 428-327.000.
Arney, Jonathan S.: *See*—
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,440,846, Cl. 430-138.000.
Arnold, Michael B.: *See*—
Giddens, Marian S.; and Arnold, Michael B., 4,440,436, Cl. 296-107.000.
Arvai, Tibor, to Verdol S.A. Double open-shed Jacquard machine for the lifting of warp yarns of a loom. 4,440,196, Cl. 139-59.000.
Asada, Hideki: *See*—
Matsui, Kanenobu; Uchiumi, Shinichiro; Asada, Hideki; and Umezu, Takashi, 4,440,928, Cl. 544-309.000.
Asahi Glass Company, Ltd.: *See*—
Oda, Yoshio; Uchida, Keiichi; Morimoto, Takeshi; and Kumai, Seisaku, 4,440,948, Cl. 562-532.000.
Asahi Kasei Kogyo Kabushiki Kaisha. *See*—
Fujiwara, Takashi; Kajita, Shuji; Matsushita, Tetsuo; and Manabe, Seiichi, 4,440,710, Cl. 264-184.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Komoto, Shinsuke; and Haneishi, Yasuyuki, 4,440,484, Cl. 354-286.000.
Urano, Fumio; and Umetsu, Junji, 4,440,403, Cl. 277-81.00R.
Asai, Yoshimi: *See*—
Yoshida, Noriyuki; and Asai, Yoshimi, 4,441,061, Cl. 318-329.000.
Asakura, Toshiyuki; Kobayashi, Hiroaki; and Noguchi, Yukio, to Toray Industries, Inc. Stabilized polyphenylene sulfide and method for producing same. 4,440,915, Cl. 525-537.000.
Asami, Toshiaki, to Diesel Kiki Co., Ltd. Fuel injection system provided with fuel injection valves having controllable valve opening pressure. 4,440,135, Cl. 123-467.000.
Asea AB: *See*—
Fredrikson, Bengt; and Hans, Bertil, 4,441,191, Cl. 373-161.000.
Aseltine, Clifford L.: *See*—
Howe, Philip M.; Gibbons, Gould; Aseltine, Clifford L.; and Williams, Frank, 4,440,296, Cl. 206-3.000.
Ashland Oil, Inc.: *See*—
Hettinger, William P., Jr.; Beck, Hubert W.; and Kovach, Stephan M., 4,440,868, Cl. 502-65.000.
Assaf, Gad, to Solmat Systems Ltd. Method of and means for maintaining a halocline in an open body of salt water. 4,440,148, Cl. 126-415.000.
Astle, William H., to Tri Tool Inc. Reaming and counterboring cutting tool. 4,440,531, Cl. 408-82.000.
Atlantic Richfield Company: *See*—
Fisher, Edwin N., 4,440,520, Cl. 404-72.000.
Go, Ting S. L.; and Miller, Richard F., 4,440,625, Cl. 208-48.0AA.
Miller, Richard F.; Go, Tony S.; and Wilson, George R., III, 4,440,666, Cl. 252-392.000.
Atlantic Richfield Company, Inc.: *See*—
Kaehler, James A., 4,440,150, Cl. 126-425.000.
Atomel Products Corporation: *See*—
Bowers, Gerald M., 4,440,538, Cl. 414-183.000.
Aubert, Jean-Pierre P. A.; and Tirole, Jacques P. H., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, S.N.E.C.-

M.A. Process for the manufacture of turbine blades cooled by means of a porous body and product obtained by the process. 4,440,834, Cl. 428-554.000.

Audino, Vincent, Jr.; and Russ, William P. Stove. 4,440,146, Cl. 126-77.000.

Auracher, Franz; and Stockmann, Michael, to Siemens Aktiengesellschaft. Planar waveguide bragg lens and its utilization. 4,440,468, Cl. 350-96.120.

Ausonia Farmaceutici s.r.l.: *See*—
de Vincentiis, Leonardo, 4,440,786, Cl. 424-319.000.
de Vincentiis, Leonardo, 4,440,787, Cl. 424-319.000.

Australian National University, The: *See*—
Rainsford, Kim D.; and Whitehouse, Michael W., 4,440,762, Cl. 424-230.000.

Auto-Register, Inc.: *See*—
Azcua, Noris S.; Margolin, George D.; and Miller, Audrey, 4,441,160, Cl. 364-900.000.

Automotive Products Limited: *See*—
Nioloux, Raymond, 4,440,283, Cl. 192-106.200.

AVA International Corporation: *See*—
Akkerman, Neil H., 4,440,223, Cl. 166-217.000.

Avallone, William J.: *See*—
Smith, Noel A.; and Avallone, William J., 4,440,582, Cl. 148-6.15R.

Avdel Limited: *See*—
Saxon, John W. C., 4,440,286, Cl. 198-380.000.

Aviram, Ari; Mayne-Banton, Veronica I.; and Srinivasan, Rangaswamy, to International Business Machines Corporation. Method for depositing a metal layer on polyesters. 4,440,801, Cl. 427-54.100.

Aykut, Kurt, to E.C.H. Will (GmbH & Co.). Apparatus for cutting and transporting sheets of paper or the like. 4,440,051, Cl. 83-72.000.

Azcua, Noris S.; Margolin, George D.; and Miller, Audrey, to Auto-Register, Inc. Point of sale terminal having prompting display. 4,441,160, Cl. 364-900.000.

Azuma, Makoto; and Hazue, Masaaki, to Nihon Medi-Physics Co., Ltd. Radioactive diagnostic agent and non-radioactive carrier therefor. 4,440,739, Cl. 424-1.100.

B. F. Goodrich Company, The: *See*—
Ross, Roderick A. L., 4,440,270, Cl. 188-264.0AA.

B-W Health Products, Inc.: *See*—
Werner, Lester W., 4,439,879, Cl. 5-60.000.

Babcock & Wilcox Company, The: *See*—
Agarwal, Suresh C., 4,440,509, Cl. 374-166.000.
Tuttle, Douglas J., 4,440,114, Cl. 122-451.200.

Bacchus, Richard E.: *See*—
Bacchus, Rockney D.; Bacchus, Richard E.; and Bacchus, Ronald A., 4,440,000, Cl. 62-310.000.

Bacchus, Rockney D.; Bacchus, Richard E.; and Bacchus, Ronald A. Evaporative cooler. 4,440,000, Cl. 62-310.000.

Bacchus, Ronald A.: *See*—
Bacchus, Rockney D.; Bacchus, Richard E.; and Bacchus, Ronald A., 4,440,000, Cl. 62-310.000.

Bader, Bernard R.: *See*—
Wallace, John A.; and Bader, Bernard R., 4,440,088, Cl. 104-7.00A.

Bailey, Clayton G. Novelty cup for forcibly ejecting liquid. 4,440,390, Cl. 272-27.00N.

Bailey, David B.; and Abel, Edward P., to Eastman Kodak Company. Vinyl-ester polymeric timing layer for color transfer assemblages. 4,440,848, Cl. 430-215.000.

Bailey, John C., to Union Carbide Corporation. Nonaqueous cell employing an anode having a boron-containing surface film. 4,440,836, Cl. 429-48.000.

Baird, William C., Jr.; Eberly, Paul E., Jr.; and Balinsky, George J., to Exxon Research and Engineering Co. Catalyst regeneration in a catalytic reforming process. 4,440,667, Cl. 502-53.000.

Baker, Paul V.; and Vehovic, David. Mobile adjustable curtain apparatus for use in room and pillar coal mining ventilation system. 4,440,070, Cl. 98-50.000.

Baker, Steven F., to General Motors Corporation. Fuel cap valve structure. 4,440,308, Cl. 220-204.000.

Baker, Wallace L.: *See*—
Helmus, Martin C.; and Baker, Wallace L., 4,440,553, Cl. 55-126.000.

Bakker, Pieter, to U.S. Philips Corporation. Overvoltage protection for a line circuit. 4,440,980, Cl. 179-81.00R.

Bakunin, Vladimir A.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.

Bakx, Martinus C. M., to Mead Corporation, The. Fully enclosed wrap-around carton. 4,440,340, Cl. 229-40.000.

Balchjunas, Povilas I.; Martinaitis, Ionas J.; Tulaba, Sauljus A.; and Pilkauskas, Alfredas B., to Kaunassky Politekhnichesky Institut. Lighting system. 4,441,055, Cl. 315-288.000.

Baldwin, David R.; and Lemak, Nicholas S., to Honeywell Information Systems Inc. Short term response enhancement for digital phase-locked loop. 4,441,195, Cl. 377-2.000.

Baldwin, John J., to Merck & Co., Inc. 3-Amino-2-hydroxypropoxyaryl imidazole derivatives. 4,440,774, Cl. 424-267.000.

Balinsky, George J.: *See*—
Baird, William C., Jr.; Eberly, Paul E., Jr.; and Balinsky, George J., 4,440,667, Cl. 502-53.000.

Bally Manufacturing Corporation: *See*—
Hooker, Donald E.; and Tojza, Roman A., 4,440,036, Cl. 74-153.000.

Baltes, Heinrich P.: *See*—
Moser, Jean-Frederic; and Baltes, Heinrich P., 4,441,138, Cl. 361-274.000.

Balthazor, Terry M.: *See*—
Chupp, John P.; Alt, Gerhard H.; and Balthazor, Terry M., 4,440,964, Cl. 568-30.000.

Baltz, Richard H.: *See*—
Seno, Eugene T.; and Baltz, Richard H., 4,440,857, Cl. 435-118.000.

Bando, Yukio: *See*—
Matsui, Ichiro; Tanaka, Tsutomu; Bando, Yukio; and Ohashi, Kiyonobu, 4,440,778, Cl. 424-274.000.

Banerji, Samir K.: *See*—
Staggers, John O.; Banerji, Samir K.; and Lalich, Michael J., 4,440,568, Cl. 75-53.000.

Banks, James C. Pipe hanger. 4,440,369, Cl. 248-62.000.

Barbe, Pierre L., to Pont-a-Mousson S.A. Control mechanism for a fire hydrant. 4,440,190, Cl. 137-272.000.

Barbeau, Dennis E., to Teledyne Industries, Inc. Integrated fuel management system. 4,441,156, Cl. 364-431.020.

Barbee, Robert B.; and Wicker, Thomas H., Jr., to Eastman Kodak Co. Polyester containers having improved gas barrier properties. 4,440,922, Cl. 528-194.000.

Bardwell, Allen E. Gravity percussion drill with upper end cocking spring and method of assembly. 4,440,245, Cl. 175-293.000.

Barho, Hans: *See*—
Denz, Helmut; and Barho, Hans, 4,440,136, Cl. 123-491.000.

Barnett, Mark L.; and Owens, John C., to Telematic Products, Inc. Universal measured service interface for step-by-step telephone exchanges. 4,440,978, Cl. 179-5.500.

Barre, Guy: *See*—
Kortbeek, Andras G. T. G.; Barre, Guy; and Durel, Jean M., 4,440,875, Cl. 518-728.000.

Bartels, Herbert D.; and Maliszewski, Leonard A., to Continental Group, Inc., The. Container assembly. 4,440,307, Cl. 220-4.00B.

Bartholme, Louis G.: *See*—
Shimotake, Hiroshi; and Bartholme, Louis G., 4,440,837, Cl. 429-112.000.

Bartlett, Gary F. Device for affixing panels in abutting relationship to a support structure. 4,439,969, Cl. 52-461.000.

Bartlett, Robert L., to Shopsmith, Inc. Planer mounting system. 4,440,204, Cl. 144-130.000.

Bartmann, Martin; Bax, Hanns-Jorg; Burzin, Klaus; and Ribbing, Wilfried, to Chemische Werke Huls AG. Method of producing high-molecular weight polyphenylene oxides. 4,440,923, Cl. 528-216.000.

Barton, Sterling C.; and Pitoniak, Joseph E., to General Electric Company. Hydrogen leak monitor for a turbine-generator. 4,440,017, Cl. 73-40.50R.

Baschong, Marcel: *See*—
Widmer, Walter R.; and Baschong, Marcel, 4,441,095, Cl. 340-347.0DD.

Base, Terence E.: *See*—
Bleiweiss, Arthur F.; and Base, Terence E., 4,440,104, Cl. 116-63.00T.

BASF Aktiengesellschaft: *See*—
Boehm, Udo; Schulze-Berge, Klaus; and Brotzler, Roland, 4,441,130, Cl. 360-106.000.
Brandstetter, Franz; Hambrecht, Juergen; and Echte, Adolf, 4,440,906, Cl. 525-68.000.
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst, deceased; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,439,933, Cl. 34-65.000.
Naarmann, Herbert; Penzien, Klaus; Muench, Volker; and Franz, Klaus-Dieter, 4,440,693, Cl. 260-439.00R.
Nissen, Dietmar; Straehle, Wolfgang; and Marx, Matthias, 4,440,705, Cl. 264-53.000.
Peinecke, Ludwig, 4,440,299, Cl. 206-387.000.
Sauer, Wolfgang; Aquila, Werner; Hoffmann, Wolfgang; Brenner, Karl; and Halbritter, Klaus, 4,440,960, Cl. 568-471.000.

BASF Wyandotte Corporation: *See*—
Wilson, Joe C.; Hirozawa, Stanley T.; and Conville, John J., 4,440,721, Cl. 422-16.000.

Basic American Industries: *See*—
Webb, Charles E., 4,441,102, Cl. 340-673.000.

Bass, Steven C.; and Goeddel, Thomas W., to Kimball International, Inc. Digital tone generation system with slot weighting of fixed width window functions. 4,440,058, Cl. 84-1.260.

Bassett, James H.; Christensen, Timothy F.; and Pearson, Mark L., to Deere & Company. Stone trap for an axial flow rotary separator. 4,440,179, Cl. 130-27.0JT.

Bassler, Alfred: *See*—
Linke, Gerda; Engelsmann, Dieter; Maas, Dieter; Bassler, Alfred; and Hackenberg, Hubert, 4,440,483, Cl. 354-212.000.

Batchelor, William H.: *See*—
Lagano, Thomas; and Batchelor, William H., 4,440,137, Cl. 123-525.000.

Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, to Degussa Aktiengesellschaft. Process for the production of vanadium carbide coatings on iron. 4,440,581, Cl. 148-6.110.

Bauer, Bernhard: *See*—
Olschewski, Armin; Herrmann, Gerhard; and Bauer, Bernhard, 4,440,401, Cl. 277-50.000.

Bauer, Hanns-Georg: *See*—
Vielstich, Gunther; Bauer, Hanns-Georg; Muhlenbeck, Josef; Otto, Josef; Feldhoff, Horst; Zollner, Dieter H.; and Rittmann, Friedrich, 4,441,190, Cl. 373-94.000.

Bauer, Klaus: *See*—
Willms, Lothar; Mildenberger, Hilmar; Gunther, Dieter; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,440,565, Cl. 71-93.000.

Baugh, John L.; and Hardy, Melvin J., to Hughes Tool Company. Setting tool. 4,440,233, Cl. 166-382.000.

Baugh, Robert T.: *See*—
Allan, Kenneth N.; Worringer, Thomas J.; and Baugh, Robert T., 4,440,293, Cl. 198-813.000.

Baughman, Ray H.: *See*—
Ivory, Dawn M.; Miller, Granville G.; Chance, Ronald R.; and Baughman, Ray H., 4,440,669, Cl. 252-518.000.

Baum, Matthew C. Motion detection apparatus for electric motors. 4,441,076, Cl. 324-158.0MG.

Baun, Danilo P.; and Eckert, Alton B., Jr., to Pitney Bowes Inc. Value printing device warning function for replacing an inking member. 4,441,197, Cl. 377-15.000.

Bausch & Lomb Incorporated: *See*—
Chromecek, Richard C.; Friends, Gary D.; Wissman, Lawrence Y.; and Yourd, Raymond A., III, 4,440,919, Cl. 526-263.000.
Clark, James A.; and Emmel, Henry J., 4,440,317, Cl. 222-103.000.

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Bartmann, Martin; Bax, Hanns-Jorg; Burzin, Klaus; and Ribbing, Wilfried, 4,440,923, Cl. 528-216.000.

Baxter Travenol Laboratories, Inc.: *See*—
Genatempo, Vince; and Karrasch, Frank, 4,440,207, Cl. 150-52.00R.
Richardson, Gerry D.; and Cairo, Joseph A., 4,441,027, Cl. 250-577.000.

Bay, David L., to GTE Products Corporation. Stabilized dimming circuit for lamp ballasts. 4,441,054, Cl. 315-219.000.

Bayer Aktiengesellschaft: *See*—
Arlt, Dieter, 4,440,947, Cl. 560-226.000.
Heins, Ferdinand; Matner, Martin; and Striegler, Hellmut, 4,440,895, Cl. 524-822.000.
Jautelat, Manfred; and Arlt, Dieter, 4,440,955, Cl. 568-419.000.
Krimm, Heinrich; and Buysch, Hans-Josef, 4,440,937, Cl. 549-228.000.
Reiff, Helmut; and Dieterich, Dieter, 4,440,901, Cl. 524-591.000.
Wolf, Gerhard D.; Bomer, Bruno; and Bierling, Robert, 4,440,892, Cl. 524-283.000.

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Bayerische Motoren Werke Aktiengesellschaft: *See*—
Kosak, Werner; and Matschinsky, Wolfgang, 4,440,419, Cl. 280-661.000.
Muller, Rudolf, 4,440,420, Cl. 280-691.000.

Baylerian, Marguerite S.: *See*—
Chen, Jackson C.; Baylerian, Marguerite S.; Davis, Bryan T.; and Rifkin, Ellis B., 4,440,659, Cl. 252-51.50A.

Bayly, Peter K.; and Oretti, John E., to Peter Bayly Associates Australia Pty. Dispensing device. 4,440,326, Cl. 222-450.000.

BBC Brown, Boveri & Company, Limited: *See*—
Maier, Franz; and Maier, Stephan, 4,441,033, Cl. 307-107.000.
Olgiati, Gianni, 4,441,089, Cl. 333-105.000.

Beach, Sidney C.: *See*—
Opaskar, Vincent C.; Beach, Sidney C.; and Zellner, Robert J., 4,440,608, Cl. 204-43.00S.

Beck, Hubert W.: *See*—
Hettinger, William P., Jr.; Beck, Hubert W.; and Kovach, Stephan M., 4,440,868, Cl. 502-65.000.

Becker, Helmut: *See*—
Schmidt, Bruno H.; and Becker, Helmut, 4,440,242, Cl. 175-107.000.

Becker, Thomas P.: *See*—
Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; and Becker, Thomas P., 4,441,021, Cl. 250-227.000.

Beckman Instruments, Inc.: *See*—
Houseman, Robin D., 4,441,071, Cl. 323-365.000.
Van Vliet, James G.; and Aralis, Frank M., 4,441,105, Cl. 340-750.000.

Behle, Gunter R.; and Hillstead, David P., to ACF Industries, Incorporated. Bottom operator for top operated bottom installed tank car valve assembly. 4,440,379, Cl. 251-144.000.

Behle, Gunter R.; and Hrinsin, John A., to ACF Industries, Incorporated. Wedgeball valve. 4,440,380, Cl. 251-144.000.

Beisel, Hermann, to Heidelberger Druckmaschinen. Dampening-inking unit for offset printing machines. 4,440,081, Cl. 101-148.000.

Beisemann, Gerd: *See*—
Feldmann, Hugo; Hollmann, Friedrich; Beisemann, Gerd; and Gartner, Horst, 4,440,012, Cl. 72-201.000.

Beitler, Bruce; and Ostendorf, Irene. Folio and notebook display stand. 4,440,373, Cl. 248-461.000.

Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, to ITT Industries, Inc. Pressure control arrangement for vehicle braking system with antiskid control equipment. 4,440,454, Cl. 303-114.000.

Bell & Howell Company: *See*—
Mischenko, Nicholas; Parker, Robert R.; and Starai, Rudolph, 4,440,478, Cl. 353-25.000.
Wells, Thomas R., 4,440,494, Cl. 355-100.000.

Bell, John L., to Burroughs Corporation. Frequency-encoding circuit for reducing distortion. 4,441,193, Cl. 375-36.000.

Bell Telephone Laboratories, Inc.: *See*—
Carroll, Arthur E., II; Lewis, Basil C., Jr.; and Yeazel, Howard T., 4,439,918, Cl. 29-840.000.
Federico, Joseph; and Waaben, Sigurd G., 4,440,985, Cl. 179-175.30F.
Macklin, John J.; Silfvast, William T.; and Wood, Obert R., II, 4,441,189, Cl. 372-76.000.
Saari, Veikko R., 4,441,080, Cl. 330-86.000.
Stone, Julian, 4,441,188, Cl. 372-54.000.

Bellamy, Norman W., to Sea Energy Associates, Limited. Energy conversion apparatus. 4,441,030, Cl. 290-53.000.

Bellay, Jeffrey D.: *See*—
McDonough, Kevin C.; Hayn, John W.; Bellay, Jeffrey D.; and Thaden, Robert C., 4,441,154, Cl. 364-200.000.

Bellows, Alfred H., to GTE Laboratories Incorporated. Solar energy collecting apparatus. 4,440,154, Cl. 126-438.000.

Bellus, Daniel; Blaser, Hans-Ulrich; Kabas, Guglielmo; Reinehr, Dieter; Spencer, Alwyn; and Weber, Kurt, to Ciba-Geigy Corporation. Process for the production of vinylstilbene compounds. 4,440,694, Cl. 260-465.00D.

Beloit Corporation: *See*—
Wedel, Gregory L., 4,440,214, Cl. 165-90.000.

Ben-Dror, Jonathan: *See*—
Vardi, Isaih; Kimchi, Yigal; and Ben-Dror, Jonathan, 4,440,001, Cl. 62-475.000.

Bendix Corporation, The: *See*—
Gliha, Edward R., Jr.; and Marks, Christopher, 4,440,463, Cl. 339-14.00R.

Bendtsen, Randall R., to Caterpillar Tractor Co. Winch apparatus. 4,440,041, Cl. 74-753.000.

Benecke, Herman P.; and Sherwood, Bob E., to Vinoxen Company, Inc., The. Oxyoctadecanoates as psychotropic agents. 4,440,781, Cl. 424-285.000.

Benedict, James J.: *See*—
Fawzi, Mahdi B.; Benedict, James J.; Bugaj, Joseph E.; Degenhardt, Charles R.; and Van Duzee, Barry F., 4,440,738, Cl. 424-1.100.

Bennett, Percy J., to Clemtex, Inc. Spin blast tool. 4,439,954, Cl. 51-411.000.

Benson, Gustav E. V., to Patra AG. Device for dispensing metered quantities of fluid from a container. 4,440,323, Cl. 222-209.000.

Bentley Laboratories, Inc.: *See*—
Gordon, Lucas S., 4,440,723, Cl. 422-47.000.

Berger, Irving. Beverage dispenser. 4,440,318, Cl. 222-129.100.

Bergeron, Hervin J., Jr., to Ledet, Stephen J., Jr.; and Elder, James Donald, part interest to each. Air circulation system and air flow elements therefor. 4,440,343, Cl. 237-69.000.

Bergstrom, Hans R.; and Malmborg, Rolf, to Aktiebolaget SAMEFA. Apparatus and the use thereof for checking the alignment of wheel axles. 4,440,495, Cl. 356-155.000.

Bergwerksverband GmbH: *See*—
Gappa, Gunther; Degel, Josef; and Juntgen, Harald, 4,439,932, Cl. 34-57.00D.
Handrick, Kurt; Kolling, Georg; and Kiedel, Paul, 4,440,957, Cl. 585-323.000.
Henning, Klaus-Dirk; Klein, Jurgen; and Harder, Burkhard, 4,440,551, Cl. 55-73.000.

Berke, Carl M., to Polaroid Corporation. Polarizer: dichroic dye in oriented polyacrylic acid/chitosan complex sheet. 4,440,541, Cl. 8-489.000.

Berkes, Klaus; Forster, Helmut; Huth, Wolfgang; Ritschel, Gunter; Schebiella, Georg; Scholz, Norbert; and Thomas, Frank-Gerhard, to Veb Kombinat Nagema. Method for continuous production of chocolate mass. 4,440,797, Cl. 426-613.000.

Berkin, George M.; and Negin, Michael, to Kulicke & Soffa Industries, Inc. Pattern recognition system. 4,441,205, Cl. 382-8.000.

Berkley, George A., to Thiokol Corporation. Acceleration actuated lanyard device. 4,440,060, Cl. 89-1.50D.

Berkman Industries, Inc.: *See*—
Berkman, Joseph L., 4,440,458, Cl. 312-9.000.

Berkman, Joseph L., to Berkman Industries, Inc. Holder for video game and computer cartridges, video film cartridges, audio/video cassettes and their storage cases. 4,440,458, Cl. 312-9.000.

Berlin, Bruce E.: *See*—
Carey, Richard D.; and Berlin, Bruce E., 4,440,082, Cl. 101-170.000.

Bernard, Daniel, to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques. Process for producing a wound capacitor an apparatus for implementing the process and a capacitor thus obtained. 4,441,139, Cl. 361-304.000.

Bernstein, Seymour: *See*—
Upeslacis, Janis; Schaub, Robert E.; and Bernstein, Seymour, 4,440,758, Cl. 424-180.000.

Berton, Kenneth S.: *See*—
Roof, Richard W.; and Berton, Kenneth S., 4,441,063, Cl. 318-722.000.

Best, David W.; and Russell, Jeffrey D., to Rockwell International Corporation. Repetitious logic state signal generation apparatus. 4,441,182, Cl. 371-25.000.

Bettcher Industries, Inc.: *See*—
Bettcher, Louis A., 4,439,924, Cl. 30-276.000.

Bettcher, Louis A., to Bettcher Industries, Inc. Rotary hand knife. 4,439,924, Cl. 30-276.000.

Betts, Edmund D., to Gregor Jonsson Associates, Inc. Spring cam for shrimp clamp. 4,439,893, Cl. 17-72.000.

Betz Laboratories, Inc.: *See*—
Puchalski, Walter J., 4,440,647, Cl. 210-712.000.

Beukers, Leonardus H. M.: *See*—
Lunshof, Willem; and Beukers, Leonardus H. M., 4,441,209, Cl. 383-45.000.

Bevilacqua, Frank; and Burger, Joseph M., to Combustion Engineering, Inc. Heated junction thermocouple level measurement apparatus. 4,440,717, Cl. 376-247.000.

Biberbach, Peter: *See*—
Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, 4,440,581, Cl. 148-6.110.

Biblarz, Oscar; Miller, James A.; and Laib, Ronald J., to United States of America, Navy. Electrohydrodynamic (EHD) control of fuel injection in gas turbines. 4,439,980, Cl. 60-39.060.

Bieber, Gerold, to Zahnradfabrik Friedrichshafen AG. Apparatus for controlling the braking effect of a hydraulic retarder. 4,440,272, Cl. 188-290.000.

Bieringer, Hermann: *See*—
Willms, Lothar; Mildenberger, Hilmar; Gunther, Dieter; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,440,565, Cl. 71-93.000.

Bierling, Robert: *See*—
Wolf, Gerhard D.; Bomer, Bruno; and Bierling, Robert, 4,440,892, Cl. 524-283.000.

Biller, Cleveland J.; and Johnson, David D., to United States of America, Agriculture. Carriage for cable logging system. 4,440,305, Cl. 212-90.000.

Black Clawson, Inc.: *See*—
Wallace, John A.; and Bader, Bernard R., 4,440,088, Cl. 104-7.00A.

Black & Decker Inc.: *See*—
Sauerwein, William D.; and Lentino, Lynn E., 4,440,238, Cl. 173-170.000.

Blackburn, Charles M.: *See*—
Fischell, Robert E.; Fountain, Glen H.; and Blackburn, Charles M., 4,440,160, Cl. 128-132.00R.

Blackwell, Bernie; Netherwood, Shelley; and Piccolo, Dominick J., to Warner-Lambert Company. Process for stabilizing peppermint oil. 4,440,790, Cl. 426-3.000.

Blackwood-Murray, Thomas J.; and Evans, David, to Aerofoam Industries (Proprietary) Limited. Idler roller. 4,440,295, Cl. 198-843.000.

Blakeslee, Marybelle C.; Olsen, Judith D.; and Romankiw, Lubomyr T., to International Business Machines Corporation. Method of electrodepositing a low coercine force, corrosion-resistant alloy of nickel, iron and boron. 4,440,609, Cl. 204-43.0ŏT.

Blaschke, Felix: *See*—
Bayer, Karl-Heinz; and Blaschke, Felix, 4,441,065, Cl. 318-808.000.

Blaser, Hans-Ulrich: *See*—
Bellus, Daniel; Blaser, Hans-Ulrich; Kabas, Guglielmo; Reinehr, Dieter; Spencer, Alwyn; and Weber, Kurt, 4,440,694, Cl. 260-465.00D.

Blattermann, Karl-Gunther; and Paelke, Jurgen, to Conrad Scholtz AG. Conveyor system. 4,440,537, Cl. 414-139.000.

Blau, James R. Snow plow. 4,439,939, Cl. 37-231.000.

Bleiweiss, Arthur F.; and Base, Terence E., to Dominion Auto Accessories Limited. Emergency warning device. 4,440,104, Cl. 116-63.00T.

Block, Aleck; and Carlson, Arthur F., to Merit Abrasive Products, Inc. Method of making an abrasive disc. 4,439,907, Cl. 29-432.100.

Block, Aleck; and Hasegawa, Hiroshi, to Merit Abrasive Products, Inc. Abrasive disc holder. 4,439,953, Cl. 51-389.000.

Block Drug Company, Inc.: *See*—
Lover, Myron J., 4,440,763, Cl. 424-230.000.

Bloomer, Ivan. Apparatus for ensuring heat exchange between a gas flow and a heat exchanger. 4,440,698, Cl. 261-148.000.

Bobylev, Leonid M.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.

BOC Group plc, The: *See*—
Kite, Oliver A., 4,440,645, Cl. 210-626.000.

Bocci, Paul M.; Sumner, Terence E.; and Wojnarowski, James R., to Motorola, Inc. Automatic selection of decryption key for multiple-key encryption systems. 4,440,976, Cl. 179-1.50R.

Bochan, John, to General Electric Company. Wobble washer. 4,440,004, Cl. 68-23.00R.

Bochumer Eisenhutte Heintzmann GmbH & Co.: *See*—
Koppers, Manfred; Bohnes, Karlheinz; and Stephan, Bernhard, 4,440,526, Cl. 405-260.000.

Bockett-Pugh, Charles P.; and Kett, Brian L., to Solartron Electronic Group Limited, The. Apparatus for signature and/or direct analysis of digital signals used in testing digital electronic circuits. 4,441,074, Cl. 324-73.00R.

Bockris, John O.: *See*—
Dhar, Hari P.; Bockris, John O.; and Lewis, Donald H., 4,440,611, Cl. 204-147.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Branched chain olefinic alcohols, thiols, esters and ethers, organoleptic uses thereof, processes for preparing same and intermediates therefor. 4,440,961, Cl. 568-840.000.

Boeckmann, Eduard F. B.: *See*—
Grantland, Gary; Montgomery, Hugh S.; Boeckmann, Eduard F. B.; and Woodworth, Larry A., 4,440,981, Cl. 179-81.00R.

Boehm, Udo; Schulze-Berge, Klaus; and Brotzler, Roland, to BASF Aktiengesellschaft. Carriage for a scanning head in recording and/or playback apparatus for disk records. 4,441,130, Cl. 360-106.000.

Bohnes, Karlheinz: *See*—
Koppers, Manfred; Bohnes, Karlheinz; and Stephan, Bernhard, 4,440,526, Cl. 405-260.000.

Bole-Vunduk, Breda: *See*—
Djordjevic, Nebojsa; Rucman, Rudolf; Jovanovic, Suncica; Bole-Vunduk, Breda; Lavric, Tone; Lavric, Boza; Gruskovnjak, Cvetka; Kocjan, Ana; and Krmelj, Hermina, 4,440,772, Cl. 424-261.000.

Bomer, Bruno: *See*—
Wolf, Gerhard D.; Bomer, Bruno; and Bierling, Robert, 4,440,892, Cl. 524-283.000.

Bondar, Mikhail J.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.

Bonis, Laszlo J., to Composite Container Corporation. Thermoformable coextruded multilayered structure. 4,440,824, Cl. 428-216.000.

Bonsack, James P., to SCM Corporation. Chlorination of titanium ores using lignitic reactive carbons. 4,440,730, Cl. 423-74.000.

Boosalis, Frieda: *See*—
Boosalis, Michael G., deceased; Boosalis, George M.; and Ferrin, Wayne, 4,440,071, Cl. 99-339.000.

Boosalis, Frieda, administratrix: *See*—
Boosalis, Michael G., deceased; Boosalis, George M.; and Ferrin, Wayne, 4,440,071, Cl. 99-339.000.

Boosalis, George M.: *See*—
Boosalis, Michael G., deceased; Boosalis, George M.; and Ferrin, Wayne, 4,440,071, Cl. 99-339.000.

Boosalis, Michael G., deceased (by Boosalis, Frieda, administratrix); Boosalis, George M.; and Ferrin, Wayne, to Boosalis, Frieda. Conveyor system for skewered foods. 4,440,071, Cl. 99-339.000.

Boreas, Willem J. L., to Sangamo Weston, Inc. Viscous dampening arrangement for taut-band suspension. 4,440,271, Cl. 188-268.000.

Borg-Warner Corporation: *See*—
Holdeman, John W., 4,440,042, Cl. 74-785.000.

Borgen, Robert H.; Reindl, Harold J.; and Pickering, Vernon L., to General Motors Corporation. Ball joint manufacture. 4,439,909, Cl. 29-453.000.

Borne, Andre; Vallod, Joseph; and Curvat, Rene, to CGEE Alsthom. Fail-safe electrical connection terminal and tightening tool. 4,440,049, Cl. 81-467.000.

Borras, Jaime A.; and Gonzalez, Ruben J., to Motorola, Inc. Multiposition switch with minimum interconnections. 4,441,098, Cl. 340-365.00R.

Bose, Ajay K.; Fernandez, Isabel F.; and Gala, Kanti J., to Laboratorio Farmaceutico Quimico "LaFarquim, S.A.". Stereospecific synthesis of isocephalosporins and 2-oxa isocephalosporins. 4,440,682, Cl. 260-239.00A.

Bott, John A. Article carrier for automotive vehicles. 4,440,333, Cl. 224-324.000.

Bottcher, Irmgard: *See*—
Niedballa, Ulrich; and Bottcher, Irmgard, 4,440,776, Cl. 424-273.00R.

Bouley, Jean-Claude; Charil, Josette; and Chaminant, Guy. A semiconductor laser light source. 4,441,187, Cl. 372-46.000.

Boutemy, Yves L.; and Edmundson, Henry N., to Schlumberger Technology Corporation. Well log depth zoning. 4,440,020, Cl. 73-152.000.

Bowers, Gerald M., to Atomel Products Corporation. Apparatus for loading and unloading a furnace. 4,440,538, Cl. 414-183.000.

Boyer, Stanton L.; and Schulz, Charles A., to Procter & Gamble Company, The. Alkaline aqueous liquid detergent compositions containing normally unstable ester perfumes. 4,440,663, Cl. 252-174.110.

Boyle, William G.: *See*—
Taylor, Donald F.; and Boyle, William G., 4,440,221, Cl. 166-106.000.

Brachet, Pierre; and Leduc, Gilbert, to La Farge Refractaires. Ceramic fiber modular assemblies for lining furnace walls. 4,440,099, Cl. 110-336.000.

Brader, Walter H., Jr.: *See*—
Sanderson, John R.; Watts, Lewis W., Jr.; and Brader, Walter H., Jr., 4,440,870, Cl. 502-207.000.

Bradford, Marion M.; Orthoefer, Frank T.; and Wright, Kenneth N., to A. E. Staley Manufacturing Company. Method for preventing gelation of corn steep liquor. 4,440,792, Cl. 426-271.000.

Bradshaw, John, to Glaxo Group Limited. Process for the preparation of a furan derivative. 4,440,938, Cl. 549-495.000.

Bradshaw, Larry R. Hopper for containing drywall joint compound. 4,440,410, Cl. 280-47.260.

Brain, Herbert: *See*—
Strong, Barry C.; and Brain, Herbert, 4,440,002, Cl. 66-126.00R.

Brakhage, Rodney D. Recoil reducer. 4,439,943, Cl. 42-74.000.

Bramer, Charles, to Lacks Industries, Inc. Remote control mirror. 4,440,039, Cl. 74-501.00M.

Brand, Werner, to Estel Hoesch Werke AG. Landing mat or the like. 4,440,363, Cl. 244-114.00R.

Brandl, Adrian: *See—*
Honolke, Friedrich; Brandl, Adrian; Schibilla, Eduard; and Hohne, Gerhard, 4,440,544, Cl. 44-51.000.

Brandstetter, Franz; Hambrecht, Juergen; and Echte, Adolf, to BASF Aktiengesellschaft. Thermoplastic molding material. 4,440,906, Cl. 525-68.000.

Braude, Irwin A., to Meloy Laboratories, Inc. Human immune interferon. 4,440,675, Cl. 260-112.00R.

Braun Aktiengesellschaft: *See—*
Schwarz, Gerhard E., 4,441,147, Cl. 363-21.000.

Breedis, John F.: *See—*
Fister, Julius C.; and Breedis, John F., 4,441,118, Cl. 357-70.000.

Brems, John H. Drive mechanism for reciprocating and multiple step index devices. 4,440,291, Cl. 198-488.000.

Brenner, Karl: *See—*
Sauer, Wolfgang; Aquila, Werner; Hoffmann, Wolfgang; Brenner, Karl; and Halbritter, Klaus, 4,440,960, Cl. 568-471.000.

Brenner, Norbert: *See—*
Ambros, Rainer; Brenner, Norbert; and Fischer, Jurgen, 4,440,673, Cl. 252-632.000.

Breslow, Jeffrey D.: *See—*
Hicks, Alan A.; and Breslow, Jeffrey D., 4,440,394, Cl. 273-157.00R.

Brighoff, John C. Furniture and drawer therefor. 4,440,460, Cl. 312-320.000.

Briley, Patrick B., to Hybrid Energy Systems, Inc. Three phase absorption systems and methods for refrigeration and heat pump cycles. 4,439,994, Cl. 62-101.000.

Briscoe, James E.; Harris, Phillip C.; and Penny, Glenn S., to Halliburton Company. Highly stable alcohol foams and methods of forming and using such foams. 4,440,653, Cl. 252-8.55R.

Bristol-Myers Company: *See—*
Montzka, Thomas A., 4,440,933, Cl. 546-193.000.

British Petroleum Company Limited, The: *See—*
Gregory, Reginald; and Westlake, David J., 4,440,958, Cl. 560-247.000.

British Petroleum Company p.l.c., The: *See—*
Cadogan, John I. G.; Gosney, Ian; and Yaslak, Salih, 4,440,676, Cl. 260-112.50R.

Broberg, Hans, to Aktiebolaget Bofors. Apparatus for concentrating mineral acids. 4,440,595, Cl. 159-13.00A.

Brother Kogyo Kabushiki Kaisha: *See—*
Yoshida, Noriyuki; and Asai, Yoshimi, 4,441,061, Cl. 318-329.000.

Brotherton, Carl R.; and Rendek, Peter M., to Motorola Inc. Impact arming device for a fuze. 4,440,086, Cl. 102-254.000.

Brotzler, Roland: *See—*
Boehm, Udo; Schulze-Berge, Klaus; and Brotzler, Roland, 4,441,130, Cl. 360-106.000.

Brown Boveri Electric Inc.: *See—*
Garzon, Ruben D., 4,440,997, Cl. 200-148.00A.
McConnell, Lorne D.; and Spencer, Edward M., 4,440,998, Cl. 200-148.00R.

Brown, Dennis N. Orthotic insert. 4,439,934, Cl. 36-44.000.

Brown Manufacturing Company: *See—*
Brown, William P.; and Harden, Jerrell W., 4,439,948, Cl. 47-1.700.

Brown, Richard E.: *See—*
Lee, Thomas D.; and Brown, Richard E., 4,440,929, Cl. 544-346.000.

Brown, William P.; and Harden, Jerrell W., to Brown Manufacturing Company. Agricultural spraying apparatus and method. 4,439,948, Cl. 47-1.700.

Brownlow, James M.; and Chang, Ifay F., to International Business Machines Corporation. Zinc silicate phosphor particles and method for making them. 4,440,831, Cl. 128-404.000.

Bruchas, Edward R. Sectionalized paperback book. 4,440,422, Cl. 281-15.00R.

Bruck, Heinz. Tubular furnace for performance of gas reactions. 4,440,727, Cl. 422-197.000.

Bruckner Apparatebau GmbH: *See—*
Koch, Werner, 4,440,003, Cl. 68-22.00R.

Bruno, Salvatore A., to Du Pont de Nemours, E. I., and Company. Nonsludging complexes of chromium and stearic acid. 4,440,574, Cl. 106-2.000.

Bryan, Deborah L.: *See—*
Gleason, John G.; Kinzig, Charles M.; and Bryan, Deborah L., 4,440,939, Cl. 549-548.000.

Buchan, Walter; Cardin, Paul P.; and Fain, Norman M., to Teknor Apex Company. Floor mat connector device. 4,440,818, Cl. 428-99.000.

Buchmuller, Gunter, to Volkswagenwerk AG. Engine block for a water-cooled internal combustion engine. 4,440,117, Cl. 123-41.720.

Budavari, John, to Merck & Co., Inc. Crystalline diastereomeric L-alpha-methyldopa POE ester and process for its preparation. 4,440,942, Cl. 560-40.000.

Budnick, Edward G., to Plains Chemical Development Co. Chelation. 4,440,646, Cl. 210-699.000.

Bugaj, Joseph E.: *See—*
Fawzi, Mahdi B.; Benedict, James J.; Bugaj, Joseph E.; Degenhardt, Charles R.; and Van Duzee, Barry F., 4,440,738, Cl. 424-1.100.

Buljan, Sergej-Tomislav: *See—*
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,440,547, Cl. 51-295.000.

Bullard, Haran W., Jr.: *See—*
Cantavespre, Samuel J., 4,440,600, Cl. 202-248.000.

Bulle, Marshall. Trailer hitch ring lock. 4,440,005, Cl. 70-14.000.

Bullions, Robert J., III; and Enger, Thomas A., to International Business Machines Corp. Instruction register content modification using plural input gates and a data flow register. 4,441,153, Cl. 364-200.000.

Burba, Christian; Goeke, Ulrich; and Esper, Norbert, to Schering AG. Method for making coatings and adhesive bonds with polyvinyl chloride plastisols having improved adhesion, and plastisols for said process. 4,440,900, Cl. 524-569.000.

Burch, Julius G. Oil well servicing processes. 4,440,229, Cl. 166-311.000.

Burckhardt, Manfred, to Daimler-Benz Aktiengesellschaft. Hydraulic brake system for two-wheeled vehicles. 4,440,452, Cl. 303-6.00A.

Burgdorf, Jochen: *See—*
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, 4,440,454, Cl. 303-114.000.

Burger, Joseph M.: *See—*
Bevilacqua, Frank; and Burger, Joseph M., 4,440,717, Cl. 376-247.000.

Burgess, James: *See—*
Milgram, Jerome H.; and Burgess, James, 4,440,523, Cl. 405-60.000.

Burgess, John A. Guideway control apparatus. 4,440,091, Cl. 104-139.000.

Burgio di Aragona, Antonio, to Fiat Auto S.p.A. Fuel injection device for diesel engines with precombustion chambers. 4,440,348, Cl. 239-533.120.

Burlington Industries, Inc.: *See—*
Koncelik, Joseph A.; Chaney, David B.; Lockard, Walter G.; and Hontz, Thomas D., 4,439,880, Cl. 5-429.000.

Burmenko, Mark, to McGraw-Edison Company. Battery charger failure alarm circuit. 4,441,066, Cl. 320-48.000.

Burndy Corporation: *See—*
Cheh, Ernest; and Allen, William, 4,439,919, Cl. 29-861.000.

Burroughs Corporation: *See—*
Bell, John L., 4,441,193, Cl. 375-36.000.
Gaertner, Gregory E.; and Wu, Ta-Ming, 4,441,037, Cl. 307-265.000.

Burrows, Janine P.: *See—*
Tabb, David L.; and Burrows, Janine P., 4,440,724, Cl. 422-56.000.

Burstell, Helmut: *See—*
Willms, Lothar; Mildenberger, Hilmar; Gunther, Dieter; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,440,565, Cl. 71-93.000.

Burton Delingpole & Company Limited: *See—*
Lowe, Jack G., 4,439,900, Cl. 24-248.0SA.

Burzin, Klaus: *See—*
Bartmann, Martin; Bax, Hanns-Jorg; Burzin, Klaus; and Ribbing, Wilfried, 4,440,923, Cl. 528-216.000.

Bush Boake Allen: *See—*
Ferber, Gerald J.; and Goddard, Peter J., 4,440,966, Cl. 585-415.000.

Bussard, Adrien; Aldinger, Fritz; and Sperner, Franz, to Kontron AG; and W. C. Heraeus GmbH. Implantable electrode. 4,440,178, Cl. 128-784.000.

Bussey, Harry, Jr. Method for making expandable filling elements of billowed configuration for packaging. 4,440,704, Cl. 264-51.000.

Butler, James R.: *See—*
Watson, James M.; and Butler, James R., 4,440,650, Cl. 252-8.55D.

Butler, Paul E., to General Motors Corporation. Compact rim tube engine air intake manifold. 4,440,120, Cl. 123-52.0MV.

Butler, William S., to Halliburton Company. Aeration preventing shock absorber. 4,440,273, Cl. 188-315.000.

Butner, Alfred N. Tax board game. 4,440,397, Cl. 273-256.000.

Buysch, Hans-Josef: *See—*
Krimm, Heinrich; and Buysch, Hans-Josef, 4,440,937, Cl. 549-228.000.

Buzbee, James M. Method of testing telephone cable pairs. 4,440,984, Cl. 179-175.30A.

Bycasin AB: *See—*
Holm, Kurt A., 4,439,882, Cl. 15-77.000.

Cadogan, John I. G.; Gosney, Ian; and Yaslak, Salih, to British Petroleum Company p.l.c., The. Process for the production of a dipeptide, a polypeptide or a protein. 4,440,676, Cl. 260-112.50R.

Cahannes, Paul: *See—*
Rossmann, Rudolf; and Cahannes, Paul, 4,440,085, Cl. 102-235.000.

Cairns, Gerald K.: *See—*
Saenz, Arsenio B., Jr.; and Cairns, Gerald K., 4,440,391, Cl. 272-93.000.

Cairo, Joseph A.: *See—*
Richardson, Gerry D.; and Cairo, Joseph A., 4,441,027, Cl. 250-577.000.

Calgon Carbon Corporation: *See—*
Hill, Joel D., 4,440,548, Cl. 55-26.000.

California Institute of Technology: *See—*
Evanchuk, Vincent L., 4,441,096, Cl. 340-347.0AD.
Lawson, Daniel D.; and England, Christopher, 4,440,733, Cl. 423-437.000.

Calvino, Ben J., to Westinghouse Electric Corp. Dead tank gas-insulated puffer-type circuit interrupter having interrupting unit in insulated casing. 4,440,996, Cl. 200-148.00A.

Campbell, John, to Cosworth Research and Development Limited. Chemically bondable foundry sand. 4,440,864, Cl. 501-95.000.

Campbell, Robert G.; and Campbell, Warren A., III, to Hilldale Enterprises. Debris receptacle, cover, and contents compressor and discharge assembly. 4,440,321, Cl. 222-153.000.

Campbell, Warren A., III: *See—*
Campbell, Robert G.; and Campbell, Warren A., III, 4,440,321, Cl. 222-153.000.

Canada, Her Majesty the Queen in right of: *See*—
Sewell, Richard B. H.; Yee, Lannie K.; and Chappell, Robert W., 4,440,162, Cl. 128-202.220.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Stehlik, Miroslva J., 4,440,064, Cl. 89-136.000.
Cannan, Thomas R.: *See*—
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 4,440,871, Cl. 502-214.000.
Cannella, Vincent: *See*—
Doehler, Joachim; Cannella, Vincent; and Gray, Richard O., Jr., 4,440,107, Cl. 118-718.000.
Canon Kabushiki Kaisha: *See*—
Hiraga, Ryozo, 4,440,493, Cl. 355-86.000.
Ikeda, Takeshi; Yamamoto, Atsuko; and Kasai, Masanao, 4,440,735, Cl. 423-561.00B.
Isaka, Kazuo; and Kan, Fumitaka, 4,440,486, Cl. 355-3.0FU.
Miura, Makoto, 4,440,487, Cl. 355-14.00R.
Suwa, Kaname, 4,441,000, Cl. 200-291.000.
Canron Inc.: *See*—
Cicin-Sain, Yvo; and Deliyski, Yvan, 4,440,089, Cl. 104-12.000.
Cantavespre, Samuel J., to Bullard, Haran W., Jr., a part interest. Spring adjusting device for a self-sealing coke oven door. 4,440,600, Cl. 202-248.000.
Cantley, Robert J. Energy management system for multi stage refrigeration systems. 4,439,997, Cl. 62-175.000.
Caputo, William R.; and Trivedi, Jitendra K., to Westinghouse Electric Corp. Tachogenerator. 4,440,024, Cl. 73-529.000.
Card, Joseph L.: *See*—
Card, Roy T.; and Card, Joseph L., 4,440,102, Cl. 112-266.200.
Card, Roy T.; and Card, Joseph L. Tufting machine and method of tufting for producing multiple rows of tufts with single lengths of yarn. 4,440,102, Cl. 112-266.200.
Cardin, Paul P.: *See*—
Buchan, Walter; Cardin, Paul P.; and Fain, Norman M., 4,440,818, Cl. 428-99.000.
Carey, Glen A.; and Hydo, Steven J., to Corning Glass Works. Combination absorbance fluorescence aspirating thermal cuvette. 4,440,497, Cl. 356-246.000.
Carey, Richard D.; and Berlin, Bruce E., to Dayco Corporation. Electrostatically assisted printing system. 4,440,082, Cl. 101-170.000.
Carlingswitch, Inc.: *See*—
Sorenson, Richard W., 4,440,991, Cl. 200-6.00R.
Carlson, Arthur F.: *See*—
Block, Aleck; and Carlson, Arthur F., 4,439,907, Cl. 29-432.100.
Carr, Dale D.: *See*—
Metro, Stephen J.; and Carr, Dale D., 4,440,657, Cl. 252-49.900.
Carroll, Arthur E., II; Lewis, Basil C., Jr.; and Yeazel, Howard T., to Western Electric Co., Inc.; and Bell Telephone Laboratories, Inc. Methods of packaging an electronic device. 4,439,918, Cl. 29-840.000.
Carstab Corporation: *See*—
Taylor, Jack D.; and Smith, Kenneth V., 4,440,891, Cl. 524-177.000.
Case, James L., to General Motors Corporation. Diesel engine combustion chamber. 4,440,125, Cl. 123-293.000.
Casio Computer Co., Ltd.: *See*—
Ishibashi, Masanori, 4,440,057, Cl. 84-1.010.
Casperovich, John J., to Ingersoll-Rand Co. Pavement breaker. 4,440,237, Cl. 173-134.000.
Cassella Aktiengesellschaft: *See*—
Tappe, Horst; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, 4,440,681, Cl. 260-207.100.
Caterpillar Tractor Co.: *See*—
Bendtsen, Randall R., 4,440,041, Cl. 74-753.000.
Grob, Robert J., 4,440,209, Cl. 152-397.000.
Celanese Corporation: *See*—
Conciatori, Anthony B.; Choe, Eui W.; and Farrow, Gerald, 4,440,945, Cl. 560-86.000.
Summerville, Richard H., deceased; and Summerville, James E., Jr., administrator, 4,440,946, Cl. 560-210.000.
Celli, Aldo. Vehicle body construction. 4,440,434, Cl. 296-185.000.
Centrale des Equipements Mobiliers et Immobiliers (CEMI): *See*—
Pennel, Jean-Francois; and Vesnier, Patrick H., 4,440,519, Cl. 403-391.000.
Ceraver: *See*—
Kaczerginski, Alexandre, 4,440,975, Cl. 174-209.000.
CGEE Alsthom: *See*—
Borne, Andre; Vallod, Joseph; and Curvat, Rene, 4,440,049, Cl. 81-467.000.
Cha-Du-Ke: *See*—
Charon, Alfred G., 4,440,398, Cl. 273-292.000.
Chaborski, Hoiko; and Mehnert, Walter, to MITEC Moderne Industrietechnik GmbH. Measuring arrangement having a plurality of measuring points connected to one another by means of a cable. 4,441,107, Cl. 340-870.160.
Chalberg, Philip E. Clamp assembly for flexible pipe installations primarily for therapy baths. 4,439,876, Cl. 4-542.000.
Chaminant, Guy: *See*—
Bouley, Jean-Claude; Charil, Josette; and Chaminant, Guy, 4,441,187, Cl. 372-46.000.
Champlain Cable Corporation: *See*—
Hawkins, Richard E., 4,440,973, Cl. 174-107.000.
Chan, David C. K., to Chevron Research Company. Fungicidal 3-(N-acyl-N-arylamino)-and 3-(N-thionoacyl-N-arylamino)-gamma-butyrolactones and gamma-thiobutyrolactones. 4,440,780, Cl. 424-275.000.
Chan, Uck I., to Ford Motor Company. Method of drilling ultrafine channels through glass. 4,441,008, Cl. 219-121.0LL.
Chance, Ronald R.: *See*—
Ivory, Dawn M.; Miller, Granville G.; Chance, Ronald R.; and Baughman, Ray H., 4,440,669, Cl. 252-518.000.
Chaney, David B.: *See*—
Koncelik, Joseph A.; Chaney, David B.; Lockard, Walter G.; and Hontz, Thomas D., 4,439,880, Cl. 5-429.000.
Chang, Clarence D.; and Perkins, Patrick D., to Mobil Oil Corporation. Catalyst for the conversion of synthesis gas to higher alcohols. 4,440,668, Cl. 502-331.000.
Chang, Ifay F.: *See*—
Brownlow, James M.; and Chang, Ifay F., 4,440,831, Cl. 128-404.000.
Chang, Paul P. H.; and Chu, Cheng-hsiang. Instant push-button fastener for fishing reel seat. 4,439,945, Cl. 43-22.000.
Chappell, Robert W.: *See*—
Sewell, Richard B. H.; Yee, Lannie K.; and Chappell, Robert W., 4,440,162, Cl. 128-202.220.
Charil, Josette: *See*—
Bouley, Jean-Claude; Charil, Josette; and Chaminant, Guy, 4,441,187, Cl. 372-46.000.
Charles Stark Draper Laboratory, The: *See*—
De Fazio, Thomas L., 4,440,031, Cl. 73-862.040.
Charles Stark Draper Laboratory, Inc., The: *See*—
Whitney, Daniel E.; and De Fazio, Thomas L., 4,439,926, Cl. 33-185.00R.
Charon, Alfred G., to Cha-Du-Ke. Card game and method of playing same. 4,440,398, Cl. 273-292.000.
Cheh, Ernest; and Allen, William, to Burndy Corporation. Automatic lead making apparatus. 4,439,919, Cl. 29-861.000.
Chemische Werke Huels, AG: *See*—
Weiss, Joern-Volker; and Riemer, Heinz, 4,440,882, Cl. 523-401.000.
Chemische Werke Huls AG: *See*—
Bartmann, Martin; Bax, Hanns-Jorg; Burzin, Klaus; and Ribbing, Wilfried, 4,440,923, Cl. 528-216.000.
Chen, Jackson C.; Baylerian, Marguerite S.; Davis, Bryan T.; and Rifkin, Ellis B., to Ethyl Corporation. Lubricating oil ashless dispersant and lubricating oils containing same. 4,440,659, Cl. 252-51.50A.
Cheng, Bo-Ching; and Adamson, Ronald B., to General Electric Company. Method of determining corrosion properties of zirconium alloys. 4,440,862, Cl. 436-6.000.
Chepurnoi, Nikolai P.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.
Chester, John K.; Small, Eric; and Stoll, Eric D. Method and apparatus for amplitude limiting a composite signal. 4,441,199, Cl. 381-14.000.
Chevron Research Company: *See*—
Chan, David C. K., 4,440,780, Cl. 424-275.000.
Eidem, Penny K., 4,440,579, Cl. 106-274.000.
Luo, Tatao, 4,440,566, Cl. 71-98.000.
Sweeney, William A., 4,440,449, Cl. 299-11.000.
Sweeney, William A., 4,440,969, Cl. 585-851.000.
Wallman, P. Henrik, 4,440,623, Cl. 208-11.00R.
Chichester, Willard L., to Clark Equipment Company. Engine compartment and air cleaner. 4,440,555, Cl. 55-385.00B.
Children's Medical Center Corporation, The: *See*—
Klagsbrun, Michael, 4,440,860, Cl. 435-240.000.
Childs, William V., to Phillips Petroleum Company. Production of MTBE and ETBE. 4,440,963, Cl. 568-697.000.
Chirgwin, John: *See*—
Rutter, William J.; Goodman, Howard M.; Ullrich, Axel; Shine, John; Chirgwin, John; and Pictet, Raymond, 4,440,859, Cl. 435-172.000.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Togari, Osamu; Matsuda, Masatoshi; Shimokawa, Kenji; and Makabe, Toshiji, 4,440,631, Cl. 208-112.000.
Choe, Eui W.: *See*—
Conciatori, Anthony B.; Choe, Eui W.; and Farrow, Gerald, 4,440,945, Cl. 560-86.000.
Christensen, Inc.: *See*—
Jurgens, Rainer, 4,440,246, Cl. 175-329.000.
Christensen, Timothy F.: *See*—
Bassett, James H.; Christensen, Timothy F.; and Pearson, Mark L., 4,440,179, Cl. 130-27.0JT.
Christie, William C., to Goodyear Tire & Rubber Company, The. Tire sidewall deformation detection techniques. 4,440,018, Cl. 73-146.000.
Christine, William C., to Trinity Associates. Combined piercer and valve for flexible bag. 4,440,316, Cl. 222-83.500.
Chromecek, Richard C.; Friends, Gary D.; Wissman, Lawrence Y.; and Yourd, Raymond A., III, to Bausch & Lomb Incorporated. Low N-vinyl lactam content based biomedical devices. 4,440,919, Cl. 526-263.000.
Chu, Cheng-hsiang: *See*—
Chang, Paul P. H.; and Chu, Cheng-hsiang, 4,439,945, Cl. 43-22.000.
Chu, Nori Y. C., to American Optical Corporation. Photochromic composition resistant to fatigue. 4,440,672, Cl. 252-586.000.
Chu, Young Y. Interior storm window. 4,439,964, Cl. 52-202.000.

Chughtai, M. Yaqub: *See—*
Michelfelder, Sigfrid; and Chughtai, M. Yaqub, 4,440,100, Cl. 110-343.000.
Chupp, John P.; Alt, Gerhard H.; and Balthazor, Terry M., to Monsanto Company. Substituted 2-alkylsulfonylalkyl nitrobenzenes and process for their preparation. 4,440,964, Cl. 568-30.000.
Ciba-Geigy AG: *See—*
Moore, Michael H.; Moss, Brian F.; and Turner, George F. A. M., 4,440,490, Cl. 355-72.000.
Ciba-Geigy Corporation: *See—*
Bellus, Daniel; Blaser, Hans-Ulrich; Kabas, Guglielmo; Reinehr, Dieter; Spencer, Alwyn; and Weber, Kurt, 4,440,694, Cl. 260-465.00D.
Helfand, David; and Sellers, Ralph F., 4,440,914, Cl. 525-482.000.
Irving, Edward, 4,440,802, Cl. 427-54.100.
Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, 4,440,696, Cl. 260-976.000.
Paul, John G.; Stark, Bernard P.; and Losert, Ewald, 4,440,850, Cl. 430-325.000.
Strasilla, Dieter; Meindl, Hubert; Moldovanyi, Laszlo; and Fearnley, Charles, 4,440,744, Cl. 424-70.000.
Cicin-Sain, Yvo; and Deliyski, Yvan, to Canron Inc. Railway track ballast tamping device. 4,440,089, Cl. 104-12.000.
Cioca, Gheorghe, to Seton Company. Macromolecular biologically active collagen articles. 4,440,680, Cl. 260-123.700.
Cipriani, Aldo: *See—*
Mazzola, Massimo; and Cipriani, Aldo, 4,440,876, Cl. 521-123.000.
Citizen Watch Co., Ltd.: *See—*
Kanno, Fumio, 4,440,502, Cl. 368-80.000.
Claas, Helmut; and Frederiksen, Nils, to Claas Ohg. Agricultural machine. 4,440,416, Cl. 280-473.000.
Claas Ohg: *See—*
Claas, Helmut; and Frederiksen, Nils, 4,440,416, Cl. 280-473.000.
Claassen, Peter: *See—*
Ruckenbauer, Friedrich; Claassen, Peter; and Krempl, Peter, 4,441,044, Cl. 310-338.000.
Clancy, Terence J.; and Kokochak, David G., to General Motors Corporation. Locknut device for engine rocker arm adjustment. 4,440,121, Cl. 123-90.390.
Clark Equipment Company: *See—*
Chichester, Willard L., 4,440,555, Cl. 55-385.00B.
Clark, Graeme M.: *See—*
Tong, Yit C.; Seligman, Peter M.; Clark, Graeme M.; Patrick, James F.; and Millar, John B., 4,441,202, Cl. 381-68.000.
Clark, James A.; and Emmel, Henry J., to Bausch & Lomb Incorporated. Sterile liquid storing and dispensing apparatus. 4,440,317, Cl. 222-103.000.
Clark, Mark J. Portable high-rise escape device. 4,440,261, Cl. 182-3.000.
Clark, Michael T.; and Gilmore, Ian J., to Shell Oil Company. Heterocyclic pentalenes as herbicides. 4,440,564, Cl. 71-90.000.
Clarke, Thomas E.; Peterson, William R.; and Parker, Mark G., to Nike, Inc. Shock attenuating outer sole. 4,439,936, Cl. 36-102.000.
Clauss Cutlery Company, a Division of Alco Standard Corporation, The: *See—*
Scranton, Joseph A., 4,439,923, Cl. 30-252.000.
Claydon, David R., to Eaton Corporation. Drum brake anchor pin assembly. 4,440,274, Cl. 188-328.000.
Clemtex, Inc.: *See—*
Bennett, Percy J., 4,439,954, Cl. 51-411.000.
Clingan, William R.; Derrenbacker, Edward L.; and Dunn, Thomas J., to Mallinckrodt, Inc. Process for the purification of p-aminophenol. 4,440,954, Cl. 564-439.000.
Clorox Company, The: *See—*
Foley, Lary L., 4,440,542, Cl. 8-523.000.
Coakley, John E., to Slurry Mining Engineering Inc. Borehole mining valve actuation. 4,440,450, Cl. 299-17.000.
Coast Manufacturing Co., Inc.: *See—*
Kappel, Joseph; and Goldberg, Richard, 4,440,334, Cl. 224-258.000.
Cochran, Phillip E. Veterinary appliance for use on a front leg of a small animal. 4,440,159, Cl. 128-84.00R.
Coe Manufacturing Company, The: *See—*
McMahon, Irven J., Jr., 4,439,930, Cl. 34-15.000.
Cohen, Jonathan D., to United States of America, National Security Agency. Space integrating ambiguity processor. 4,440,472, Cl. 350-162.120.
Cohen, Stanley N.: *See—*
Michaels, Alan S.; Robertson, Channing R.; and Cohen, Stanley N., 4,440,853, Cl. 435-68.000.
Cole, Clinton W.: *See—*
Roach, James D.; and Cole, Clinton W., 4,440,404, Cl. 277-124.000.
Coleman, Guy B.; Henderson, James W.; and Sacks, Jacob M., to Hughes Aircraft Company. Real-time ordinal-value filters utilizing complete intra-data comparisons. 4,441,165, Cl. 364-900.000.
Colgate-Palmolive Company: *See—*
Hauschild, John P.; and Principe, Joseph R., 4,440,877, Cl. 523-105.000.
Marschner, Frank W., 4,440,741, Cl. 424-65.000.
Marschner, Frank W., 4,440,742, Cl. 424-65.000.
Colistro, Vincent, to Schulte Industries Ltd. Rock windrower. 4,440,235, Cl. 171-63.000.
Collagen Corporation: *See—*
Glowacki, Julianne; and Pharriss, Bruce B., 4,440,750, Cl. 424-95.000.
Colliaux, Daniel, to Compagnie d'Applications Mecaniques a l'Electronique, au Cinema et a l'Atomistique (C.A.M.E.C.A.). Electron probe microanalyzer comprising an observation system having double magnification. 4,440,475, Cl. 350-502.000.
Collins, Clifford B.; and James, William G., to General Electric Company. Electrostatic silica coating for electric lamps. 4,441,047, Cl. 313-116.000.
Collins, Ronald B.; Dowzall, Martin E.; Smith, Brian J.; and Taylor, Geoffrey R., to Letraset Corp. Manufacture of signs. 4,440,590, Cl. 156-234.000.
Collurafici, Francisco A.; and Lee, Ralph L., to Fairchild Industries, Inc. Handle and fastening apparatus. 4,440,431, Cl. 294-27.00H.
Colonna, William J.: *See—*
Horwath, Robert O.; and Colonna, William J., 4,440,855, Cl. 435-105.000.
Colwell, Robert, to Univeral Electric Company. Electric motor. 4,441,042, Cl. 310-42.000.
Combustion Engineering, Inc.: *See—*
Bevilacqua, Frank; and Burger, Joseph M., 4,440,717, Cl. 376-247.000.
Commissariat a l'Energie Atomique: *See—*
Cornu, Jean; Detriche, Jean-Marie; Gil, Pierre; Marchal, Paul; and Vertut, Jean, 4,441,010, Cl. 219-124.340.
Gourdon, Pierre; Goutard, Rene; and Piry, Pierre, 4,439,905, Cl. 29-402.040.
Pravot, Jean; and Roquefort, Andre, 4,440,382, Cl. 251-248.000.
Commonwealth of Australia: *See—*
Keeler, Arthur A.; Rice, William M.; and Tremayne, Edward C., 4,440,366, Cl. 244-138.00R.
Commonwealth Scientific and Industrial Research: *See—*
Morton, David H.; Szirmai, Stephen G.; and Potter, Edmund C., 4,440,800, Cl. 427-13.000.
Compagnie d'Applications Mecaniques a l'Electronique, au Cinema et a l'Atomistique (C.A.M.E.C.A.): *See—*
Colliaux, Daniel, 4,440,475, Cl. 350-502.000.
Compagnie Francaise des Petroles: *See—*
Le Therisien, Louis, 4,440,524, Cl. 405-154.000.
Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
Hanna, Charas, 4,441,204, Cl. 382-7.000.
Completion Services, Inc.: *See—*
Farley, David L., 4,440,218, Cl. 166-51.000.
Composite Container Corporation: *See—*
Bonis, Laszlo J., 4,440,824, Cl. 428-216.000.
Conciatori, Anthony B.; Choe, Eui W.; and Farrow, Gerald, to Celanese Corporation. Anisotropic heat-curable acetylene-terminated monomers and thermoset resins produced therefrom. 4,440,945, Cl. 560-86.000.
Cone, Steven S.; Jones, David E.; and Serkland, Richard C. Retractable aircraft step. 4,440,364, Cl. 244-129.600.
Conoco Inc.: *See—*
Echtler, J. Paul, 4,440,543, Cl. 44-51.000.
Lancet, Michael S.; and Gorin, Everett, 4,440,546, Cl. 48-202.000.
Martin, Albert E., 4,440,231, Cl. 166-373.000.
Shannon, Mark L.; and Mack, Mark P., 4,440,869, Cl. 502-104.000.
Conpaten, Ltd.: *See—*
Neuberger, Manfred, 4,440,400, Cl. 273-411.000.
Conrad Scholtz AG: *See—*
Blattermann, Karl-Gunther; and Paelke, Jurgen, 4,440,537, Cl. 414-139.000.
Consolidated Papers, Inc.: *See—*
Jeltema, Paul A., 4,440,105, Cl. 118-410.000.
Vreeland, William C., 4,440,809, Cl. 427-356.000.
Conti, Raul J., to Lockheed Missiles & Space Company, Inc. Finned heat exchanger tube. 4,440,216, Cl. 165-117.000.
Continental Group, Inc., The: *See—*
Bartels, Herbert D.; and Maliszewski, Leonard A., 4,440,307, Cl. 220-4.00B.
Heyn, William M., 4,440,310, Cl. 220-270.000.
Conville, John J.: *See—*
Wilson, Joe C.; Hirozawa, Stanley T.; and Conville, John J., 4,440,721, Cl. 422-16.000.
Cook, Mary J.; and Hyche, Kenneth W., to Eastman Kodak Company. Fire resistant hot-melt adhesives containing modified polyethylene. 4,440,888, Cl. 524-139.000.
Cooper, Adrianus A. G.: *See—*
Marrujo, Ralph G.; and Cooper, Adrianus A. G., 4,440,441, Cl. 297-216.000.
Cooper, Ernest B.: *See—*
Risbeck, James D.; and Cooper, Ernest B., 4,441,012, Cl. 219-137.00R.
Coquillart, Michel, to Mavilor Systemes. Method and means for manufacturing frontal commutators of electric motors, more particularly of the type having an insulation between the commutator bars. 4,439,913, Cl. 29-597.000.
Corby, David C.: *See—*
Shelton, William E. A.; and Corby, David C., 4,440,353, Cl. 242-47.010.
Cordova, Robert A., to Kayser-Roth Corporation. Woman's garment. 4,440,174, Cl. 128-455.000.
Corning Glass Works: *See—*
Carey, Glen A.; and Hydo, Steven J., 4,440,497, Cl. 356-246.000.
Flannery, James E.; Mach, Joseph F.; and Wexell, Dale R., 4,440,576, Cl. 106-85.000.
Forker, Ray B., Jr., 4,440,810, Cl. 427-376.200.
Lock, William E., 4,440,589, Cl. 156-232.000.
Cornu, Jean; Detriche, Jean-Marie; Gil, Pierre; Marchal, Paul; and Vertut, Jean, to Commissariat a l'Energie Atomique. Process and

apparatus for the lateral positioning of a member relative to a joint. 4,441,010, Cl. 219-124.340.
Coaden Technology, Inc.: *See*—
Watson, James M.; and Butler, James R., 4,440,650, Cl. 252-8.55D.
Cosworth Research and Development Limited: *See*—
Campbell, John, 4,440,864, Cl. 501-95.000.
Coulson, Dale M. Apparatus for electrochemical detection and coulometric titration. 4,440,726, Cl. 422-89.000.
Couture, Paul A.: *See*—
Jentoft, Arthur P.; and Couture, Paul A., 4,439,962, Cl. 52-200.000.
Couvillion, Mark C., to Dow Chemical Company, The. Selective hydrogenation of acetylenes in the presence of butadiene and catalyst used in the hydrogenation. 4,440,956, Cl. 585-260.000.
Cox Hobbies Inc.: *See*—
Theobald, Roger D., 4,440,122, Cl. 123-185.00D.
Crano, John C.; and Haynes, Ronald L., to PPG Industries, Inc. Blends of bis(allyl carbonate) monomers with polymers and polymer blends produced therefrom. 4,440,909, Cl. 525-277.000.
Creusot-Loire: *See*—
Pere, Gerard, 4,440,615, Cl. 204-253.000.
Cronan, Charles L.: *See*—
Goldstein, Henry; Hoff, Joseph T.; Cronan, Charles L.; and Rao, Ch. S., 4,440,795, Cl. 426-592.000.
Crosby Group, Inc., The: *See*—
Goris, Hugo M. J., 4,440,432, Cl. 294-82.00R.
Crossley, Roger; and Dickinson, Kay H., to John Wyeth & Brother Limited. Pyridylalkylenethiopridyl, -tetrahydropyridyl and -pyridinium compounds. 4,440,773, Cl. 424-263.000.
Crown Zellerbach Corporation: *See*—
Weis, Rudolf R., 4,440,289, Cl. 198-448.000.
Cummins Engine Company, Inc.: *See*—
Matheson, Charles L., 4,440,193, Cl. 137-558.000.
Stang, John H.; and Cusick, Steven M., 4,440,118, Cl. 123-41.840.
Cunningham, William B., Jr.: *See*—
Nitchman, Harold L.; and Cunningham, William B., Jr., 4,440,319, Cl. 222-131.000.
Curtis & Marble Corp.: *See*—
Laing, Robert, 4,439,975, Cl. 53-399.000.
Curvat, Rene: *See*—
Borne, Andre; Vallod, Joseph; and Curvat, Rene, 4,440,049, Cl. 81-467.000.
Cusick, Steven M.: *See*—
Stang, John H.; and Cusick, Steven M., 4,440,118, Cl. 123-41.840.
Cutler, John H.; and Walker, Loren H., to General Electric Company. Twelve-pulse operation of a controlled current inverter motor drive. 4,441,064, Cl. 318-798.000.
Cutter Laboratories, Inc.: *See*—
Fernandes, Peter M.; and Lundblad, John L., 4,440,679, Cl. 260-122.000.
Dahlberg, Reinhard, to Higratherm Electric GmbH. Thyristor having a center pn junction formed by plastic deformation of the crystal lattice. 4,441,115, Cl. 357-38.000.
Dai-Nghia, Huynh: *See*—
Jacquin, Yves; Gimenez-Coronado, Manuel; and Dai-Nghia, Huynh, 4,440,633, Cl. 208-309.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Tabuchi, Kazuhiro, 4,440,841, Cl. 430-5.000.
Daikin Kogyo Co., Ltd.: *See*—
Kawachi, Shoji; Yamamoto, Katsutoshi; and Kai, Shinichiro, 4,440,879, Cl. 523-200.000.
Daimler-Benz AG: *See*—
Steinecke, Rudolf; and Hensche, Karl-Heinz, 4,440,252, Cl. 180-89.150.
Daimler-Benz Aktiengesellschaft: *See*—
Burckhardt, Manfred, 4,440,452, Cl. 303-6.00A.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Mizuta, Masaji, 4,439,931, Cl. 34-44.000.
Sakamoto, Takashi; Sano, Tetsuo; and Kodama, Eiji, 4,441,020, Cl. 250-202.000.
Daiwa Can Company, Limited: *See*—
Konagaya, Takeshi; and Yagi, Yukinao, 4,440,016, Cl. 73-40.000.
Dale, Steinar J., to United States of America, Energy. Vertically aligned gas-insulated transmission line having particle traps at the inner conductor. 4,440,970, Cl. 174-14.00R.
Dana Corporation: *See*—
Foulk, Donald H., 4,440,035, Cl. 74-89.150.
Schaus, Jerome E.; and Danek, Daniel, 4,440,405, Cl. 277-134.000.
Danckert, Hermann, to Volkswagenwerk Aktiengesellschaft. Vibration-insulating bearing arrangement for a drive unit. 4,440,257, Cl. 180-300.000.
Danek, Daniel: *See*—
Schaus, Jerome E.; and Danek, Daniel, 4,440,405, Cl. 277-134.000.
Dang, Hang T.: *See*—
Powers, John H.; and Dang, Hang T., 4,440,606, Cl. 204-33.000.
Daniel, Jean-Claude: *See*—
Schuppiser, Jean-Luc; and Daniel, Jean-Claude, 4,440,896, Cl. 524-458.000.
D'Apuzzo, Sebastiano, to Aeritalia Societa Aerospaziale Italiana p.A. Drill bit for drilling holes in composite fiber/resin laminates. 4,440,532, Cl. 408-229.000.
Daringer, Ronald G., to Maryland Wire Belts, Inc. Barrier-type metal wire fabric and its manufacture. 4,440,367, Cl. 245-6.000.
Dark, Richard C. G. Fluid dispensing closure with integral valve. 4,440,327, Cl. 222-530.000.
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; Muller, Henrik; Nyiro, Katalin; and Takacs, Ferenc, to Radelkis Elektrokemiai Muszergyarto Szovetkezet. Electro-analytical measuring equipment with measuring cell, comprising integral sensing element and several reference electrodes. 4,440,619, Cl. 204-401.000.
Dart Industries Inc.: *See*—
Dieckmann, Dale J.; and Fletcher, Charles W., 4,440,674, Cl. 524-177.000.
Dart, John R. Universal hammer having interchangeable heads. 4,440,206, Cl. 145-29.00R.
Daspit, John I., to Data-Design Laboratories. Switched mode electrode ballast. 4,441,053, Cl. 315-206.000.
Daswick, Alexander C. Integrally cast shoe sole containing stiffener member. 4,439,937, Cl. 36-107.000.
Data-Design Laboratories: *See*—
Daspit, John I., 4,441,053, Cl. 315-206.000.
Data Packaging Corporation: *See*—
Ocko, Stephen, 4,439,949, Cl. 47-61.000.
Daussan, Andre: *See*—
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,440,575, Cl. 106-38.220.
Daussan, Gerard: *See*—
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,440,575, Cl. 106-38.220.
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre. Granular insulation product and process for its preparation. 4,440,575, Cl. 106-38.220.
Davidson, James P.; Rosenberg, Barnett; and Hinz, Ronald W., to Research Corporation. Method of treating viral infections. 4,440,782, Cl. 424-287.000.
Davies, David L., to General Foods Corporation. Instant rice pudding mix. 4,440,794, Cl. 426-578.000.
Davies, Robert B.; and Joseph, Eric D., to Motorola, Inc. Voltage regulator circuit with supply voltage ripple rejection to transient spikes. 4,441,070, Cl. 323-268.000.
Davis, Bryan T.: *See*—
Chen, Jackson C.; Baylerian, Marguerite S.; Davis, Bryan T.; and Rifkin, Ellis B., 4,440,659, Cl. 252-51.50A.
Davis, Edward L.: *See*—
Mowatt-Larssen, Erling; and Davis, Edward L., 4,440,528, Cl. 406-90.000.
Davis, William D., to Electric Power Research Institute, Inc. Resistivity sensor system for detecting faults in sealed gas-insulated electrical apparatus. 4,441,073, Cl. 324-52.000.
Davlantes, George N. Tubing coupling. 4,440,518, Cl. 403-297.000.
Dawless, Robert K.; LaCamera, Alfred F.; and Klingensmith, Chester H., to Aluminum Company of America. Molten salt bath for electrolytic production of aluminum. 4,440,610, Cl. 204-67.000.
Dayco Corporation: *See*—
Carey, Richard D.; and Berlin, Bruce E., 4,440,082, Cl. 101-170.000.
Mathieu, Julien C., 4,440,095, Cl. 105-225.000.
Dayger, Douglas A.; Hryck, Michael D.; Skinner, Dean W.; and Westcott, Gerald R., to International Business Machines Corporation. Control system for timing hammers of impact printers. 4,440,079, Cl. 101-93.030.
Dean, Donald E.: *See*—
Stevenson, Edward J.; and Dean, Donald E., 4,440,588, Cl. 156-157.000.
Dearman, Timothy C. Pipe cutting apparatus. 4,440,383, Cl. 266-54.000.
DeBernardis, John F.; and Winn, Martin, to Abbott Laboratories. 2-(4-Phenylalkanoylpiperazin-1-yl) quinazoline compounds, pharmaceutical compositions and method of producing α_1 antagonistic activity. 4,440,769, Cl. 424-251.000.
DeCesare, Dominic. Compound interaction/induction electric rotating machine. 4,441,043, Cl. 310-46.000.
Decker, Dalton L.: *See*—
VanEffen, Richard M.; McLean, James D.; and Decker, Dalton L., 4,440,603, Cl. 204-1.00T.
Deckert, Andreas: *See*—
Abermeth, Hubert; Deckert, Andreas; Muller, Helmut; and Wahnschaffe, Jurgen, 4,440,126, Cl. 123-321.000.
Deere & Company: *See*—
Bassett, James H.; Christensen, Timothy F.; and Pearson, Mark L., 4,440,179, Cl. 130-27.0JT.
Hahm, Gunter; Pauli, Klaus; and Schleicher, Walter, 4,440,437, Cl. 296-190.000.
Kittle, Carl E.; and Roach, James E., 4,440,040, Cl. 74-527.000.
Wykhuis, Lloyd A.; and Kuhn, John B., 4,440,415, Cl. 280-460.00A.
De Fazio, Thomas L., to Charles Stark Draper Laboratory, The. Force detecting system for remote center compliance device. 4,440,031, Cl. 73-862.040.
De Fazio, Thomas L.: *See*—
Whitney, Daniel E.; and De Fazio, Thomas L., 4,439,926, Cl. 33-185.00R.
De Freitas, Elias M., to Termolar S/A. Wide-mouthed isothermal container with integrated handle equipped with immersed pump. 4,440,328, Cl. 222-538.000.
Degel, Josef: *See*—
Gappa, Gunther; Degel, Josef; and Juntgen, Harald, 4,439,932, Cl. 34-57.00D.
Degenhardt, Charles R.: *See*—
Fawzi, Mahdi B.; Benedict, James J.; Bugaj, Joseph E.; Degenhardt, Charles R.; and Van Duzee, Barry F., 4,440,738, Cl. 424-1.100.
Degussa Aktiengesellschaft: *See*—
Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, 4,440,581, Cl. 148-6.110.
Effenberger, Franz; and Zoller, Gerhard, 4,440,686, Cl. 260-34.000.

Deinhammer, Wolfgang, to Wacker-Chemie GmbH. Process for the manufacture of chloroacetaldehyde dimethyl acetal. 4,440,959, Cl. 568-604.000.

De Jonge, Jelis: *See*—
Lippits, Gerardus J. M.; Van Den Broek, Arnoldus J. M.; Op Het Veld, Adriaan J. G.; Dijkstra, Rinse; and De Jonge, Jelis, 4,440,586, Cl. 156-151.000.

Deliyski, Yvan: *See*—
Cicin-Sain, Yvo; and Deliyski, Yvan, 4,440,089, Cl. 104-12.000.

Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Motorized weighing conveyor. 4,440,249, Cl. 177-145.000.

De Meester, Emiel P. J.: *See*—
Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; De Meester, Emiel P. J.; Van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., 4,441,049, Cl. 313-486.000.

Demetriou, Andreas, to Mitel Corporation. CMOS Turn-on circuit. 4,441,035, Cl. 307-200.00B.

Denz, Helmut; and Barho, Hans, to Robert Bosch GmbH. Electronically controlled fuel metering system for an internal combustion engine. 4,440,136, Cl. 123-491.000.

Derbyshire, Francis J.; Varghese, Philip; and Whitehurst, Darrell D., to Mobil Oil Corporation. Integration of short-contact-time liquefaction and critical solvent deashing with gasification through methanol-to-gasoline. 4,440,622, Cl. 208-8.0LE.

Derrenbacker, Edward L.: *See*—
Clingan, William R.; Derrenbacker, Edward L.; and Dunn, Thomas J., 4,440,954, Cl. 564-439.000.

Deryk, George. Display bracket and attachment. 4,439,940, Cl. 40-10.00R.

Desmarais, Mark R., to AMP Incorporated. Low profile keyboard switch actuating assembly. 4,440,992, Cl. 200-340.000.

DeSoto, Inc.: *See*—
Zychowski, Edwin A.; Jasenof, Kenneth E.; and Jimenez, Artemio L., 4,440,894, Cl. 524-390.000.

Detriche, Jean-Marie: *See*—
Cornu, Jean; Detriche, Jean-Marie; Gil, Pierre; Marchal, Paul; and Vertut, Jean, 4,441,010, Cl. 219-124.340.

Dettmers, Michael; and Weirich, Walter, to Gewerkschaft Eisenbutte Westfalia. Hydraulic control arrangement for a roof support unit of a mineral mining installation. 4,440,522, Cl. 405-293.000.

DeVale, Donald P.; and Wieser, Joseph, to Everpure, Inc. Liquid dispenser with timing circuit. 4,440,200, Cl. 141-95.000.

de Vincentiis, Leonardo, to Ausonia Farmaceutici s.r.l. Compounds with antiinflammatory and analgesic activity, process for the preparation thereof and pharmaceutical compositio ns therefrom. 4,440,786, Cl. 424-319.000.

de Vincentiis, Leonardo, to Ausonia Farmaceutici s.r.l. Compounds with antiinflammatory and analgesic activity, process for the preparation thereof and pharmaceutical compositions therefrom. 4,440,787, Cl. 424-319.000.

DeWoolfson, Bruce H., to Environmental Products Corporation. Automated aluminum can redemption center for direct return deposit payout. 4,440,284, Cl. 194-4.00R.

Dextomat Machinery Limited: *See*—
Hodges, Michael J., 4,440,329, Cl. 223-43.000.

Dhar, Hari P.; Bockris, John O.; and Lewis, Donald H., to Texas A & M University System, The. Cathodic electrochemical process for preventing or retarding microbial and calcareous fouling. 4,440,611, Cl. 204-147.000.

Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. Amidinoureas. 4,440,765, Cl. 424-244.000.

Diamond Shamrock Corporation: *See*—
Marcellis, Alphonso W.; and Johnson, Grannis S., 4,440,577, Cl. 106-90.000.
Solomon, Frank, 4,440,617, Cl. 204-290.00R.

Dickinson, Kay H.: *See*—
Crossley, Roger; and Dickinson, Kay H., 4,440,773, Cl. 424-263.000.

Dideco S.p.A: *See*—
Luppi, Libero, 4,440,722, Cl. 422-46.000.

Dieckmann, Dale J.; and Fletcher, Charles W., to Dart Industries Inc. Synergistic vinyl halide stabilizer compositions of antimony organic sulfur-containing compounds, alkaline earth carboxylates and alkali metal carbonates. 4,440,674, Cl. 524-177.000.

Dielenberg, Olif F., to Isorast Thermacell (U.S.A.), Inc. Apparatus in and relating to building formwork. 4,439,967, Cl. 52-309.120.

Diery, Helmut; and Mees, Bernhard, to Hoechst Aktiengesellschaft. Biesters of alkenylsuccinic acids and ethylene oxide/propylene oxide block polymers and their use. 4,440,902, Cl. 525-404.000.

Diesel Kiki Co., Ltd.: *See*—
Asami, Toshiaki, 4,440,135, Cl. 123-467.000.
Terada, Tomohiko; and Komada, Hideaki, 4,440,132, Cl. 123-446.000.

Dieterich, Dieter: *See*—
Reiff, Helmut; and Dieterich, Dieter, 4,440,901, Cl. 524-591.000.

Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst, deceased (Kissel, Gerd, legal representative); Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, to BASF Aktiengesellschaft. Apparatus for drying and heating nylon granules. 4,439,933, Cl. 34-65.000.

Dietz, Peter W.; and Wood, Ralph T., to General Electric Company. Apparatus and method for coating with an atomizable material. 4,440,350, Cl. 239-703.000.

Dijkstra, Rinse: *See*—
Lippits, Gerardus J. M.; Van Den Broek, Arnoldus J. M.; Op Het Veld, Adriaan J. G.; Dijkstra, Rinse; and De Jonge, Jelis, 4,440,586, Cl. 156-151.000.

Discovision Associates: *See*—
Slaten, Gary G., 4,441,179, Cl. 369-275.000.

Divoux, Michel; and Dorez, Michel, to Hotchkiss-Brandt Sogeme H.B.S. Apparatus for stacking thin flexible objects. 4,440,388, Cl. 271-195.000.

Djordjevic, Nebojsa; Rucman, Rudolf; Jovanovic, Suncica; Bole-Vunduk, Breda; Lavric, Tone; Lavric, Boza; Gruskovnjak, Cvetka; Kocjan, Ana; and Krmelj, Hermina, to LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o. Acid addition salts of dextrorotatory ergot alkaloids, a process for the preparation thereof as well as their use as medicines. 4,440,772, Cl. 424-261.000.

DLlama-Gabilondo y Cia, S.A.: *See*—
Mª Gabilondo, Jose, 4,439,942, Cl. 42-66.000.

Dmitrieva, Nina M.: *See*—
Albertinsky, Boris I.; Dmitrieva, Nina M.; Evseev, Anatoly K.; Zotov, Ivan P.; Ivanov, Andrei S.; Sviniin, Mikhail P.; Suslov, Valentin A.; and Fedotov, Mikhail T., 4,441,150, Cl. 363-126.000.

Dobek, Arthur S.: *See*—
Scovill, John P.; Klayman, Daniel L.; Massie, Samuel P.; Grant, Steven D.; Gonzalez, Armando; Morrison, Norman E.; and Dobek, Arthur S., 4,440,771, Cl. 424-258.000.

Dobson, John V., to National Research Development Corporation. Apparatus and method for measuring the concentration of ions. 4,440,602, Cl. 204-1.00T.

Doctor, Alan P.; and Oettel, Friedrich H., to Eltec Instruments, Inc. High output differential pyroelectric sensor. 4,441,023, Cl. 250-338.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Struck, Carl-Heinz; Schumacher, Ralf; and Thubeauville, Heinz, 4,440,599, Cl. 202-141.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Eyb, Wolfgang, 4,440,429, Cl. 293-120.000.

Doddi, Namassivaya: *See*—
Mattei, Frank V.; and Doddi, Namassivaya, 4,440,789, Cl. 424-78.000.

Dodgen, David F.; and Siegl, Ludwig R., to International Business Machines. Real time eddy current responsive Hall effect device tachometer. 4,441,077, Cl. 324-164.000.

Dodson, Stuart A.: *See*—
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,440,949, Cl. 564-48.000.

Doehler, Joachim; Cannella, Vincent; and Gray, Richard O., Jr., to Energy Conversion Devices, Inc. Magnetic apparatus for reducing substrate warpage. 4,440,107, Cl. 118-718.000.

Doherty, James B.; Dorn, Conrad P.; Witzel, Bruce E.; Allison, Debra L.; and Shen, Tsung-Ying, to Merck & Co., Inc. Tricyclic derivatives of substituted pyrrole acids as analgesic and anti-inflammatory agents. 4,440,779, Cl. 424-274.000.

Dominion Auto Accessories Limited: *See*—
Bleiweiss, Arthur F.; and Base, Terence E., 4,440,104, Cl. 116-63.00T.

Donnelly, Brian G.; and Stearns, Charles F., to United Technologies Corporation. Minimization of pressure drop variation in flow controllers. 4,440,192, Cl. 137-501.000.

Dorez, Michel: *See*—
Divoux, Michel; and Dorez, Michel, 4,440,388, Cl. 271-195.000.

Dorn, Conrad P.: *See*—
Doherty, James B.; Dorn, Conrad P.; Witzel, Bruce E.; Allison, Debra L.; and Shen, Tsung-Ying, 4,440,779, Cl. 424-274.000.

Doshak, John M.: *See*—
Hergenrother, William L.; and Doshak, John M., 4,440,889, Cl. 524-143.000.

Doughty, John L., to Press On, Inc. Membrane switch. 4,440,999, Cl. 200-5.00A.

Douglas, George H.; Studt, William L.; and Dodson, Stuart A., to William H. Rorer, Inc. Amidinoureas. 4,440,949, Cl. 564-48.000.

Douglas, George H.: *See*—
Diamond, Julius; and Douglas, George H., 4,440,765, Cl. 424-244.000.

Douglas, Walter L.: *See*—
Thorson, John T., 4,440,986, Cl. 179-2.0DP.

Dow Chemical Company, The: *See*—
Couvillion, Mark C., 4,440,956, Cl. 585-260.000.
Flagg, Edward E., 4,440,943, Cl. 560-65.000.
Pearce, Roscoe L., 4,440,731, Cl. 423-228.000.
VanEffen, Richard M.; McLean, James D.; and Decker, Dalton L., 4,440,603, Cl. 204-1.00T.

Downing, Harry M., to Weiss, Bernard; Stern, Jonathan J.; and Houseworth, Burt B. Composition for repelling animals from garbage and the like. 4,440,783, Cl. 424-302.000.

Dowzall, Martin E.: *See*—
Collins, Ronald B.; Dowzall, Martin E.; Smith, Brian J.; and Taylor, Geoffrey R., 4,440,590, Cl. 156-234.000.

Doyen, Jean: *See*—
Resneau, Jean-Claude; Roset, Pierre; and Doyen, Jean, 4,440,828, Cl. 428-334.000.

Doyle, Michael J.: *See*—
Abouchar, John W.; and Doyle, Michael J., 4,440,021, Cl. 73-204.000.

Dragerwerk Aktiengesellschaft: *See*—
Winkler, Jorg; Matthiessen, Hans; Warncke, Ernst; and Pasternack, Adalbert, 4,440,166, Cl. 128-204.220.

Drain, Robert E., to Montana Power Company, The. Three-phase power transmission line phase-to-ground fault responder. 4,441,135, Cl. 361-47.000.

Drake, Charles A., to Phillips Petroleum Company. Process for preparation of aminobenzaldehydes and aminobenzylketones. 4,440,950, Cl. 564-305.000.

Drake, Charles A., to Phillips Petroleum Company. Process for preparation of aminobenzaldehydes and aminobenzylketones. 4,440,951, Cl. 564-305.000.

Drake, Charles A., to Phillips Petroleum Company. Purification of N-substituted aminobenzaldehydes. 4,440,953, Cl. 564-437.000.

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Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.

Drouillard, James R.; and Rees, Richard W. A., to General Motors Corporation. Seat position control mechanism. 4,440,442, Cl. 297-341.000.

Dryden, Hugh L.; and Hill, John B., to G. D. Searle & Co. Method and intermediates for producing α-L-aspartyl-L-phenylalanine. 4,440,677, Cl. 260-112.50R.

Dugan, Charles; and Dugan, Timothy, to Farm Fresh Shrimp Corporation. Method and apparatus for rearing post-larvae shrimp. 4,440,109, Cl. 119-2.000.

Dugan, Timothy: *See*—
Dugan, Charles; and Dugan, Timothy, 4,440,109, Cl. 119-2.000.

Duke University: *See*—
Haagensen, Darrow E., Jr., 4,440,863, Cl. 436-539.000.

Duncan, Robert B.: *See*—
Golden, Donald; and Duncan, Robert B., 4,440,170, Cl. 128-325.000.

Dunkelberger, David L., to Rohm and Haas Company. Dunkelspersers. 4,440,905, Cl. 525-66.000.

Dunlop Limited: *See*—
Popplewell, Frank W., 4,440,392, Cl. 273-73.00C.

Dunn, Thomas J., to United States of America, National Aeronautics and Space Administration. Pre-stressed thermal protection systems. 4,439,968, Cl. 52-404.000.

Dunn, Thomas J.: *See*—
Clingan, William R.; Derrenbacker, Edward L.; and Dunn, Thomas J., 4,440,954, Cl. 564-439.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bruno, Salvatore A., 4,440,574, Cl. 106-2.000.
Resnick, Paul R., 4,440,917, Cl. 526-243.000.

Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Azolylalkylguanidines as histamine H_2-antagonists. 4,440,775, Cl. 424-269.000.

Durel, Jean M.: *See*—
Kortbeek, Andras G. T. G.; Barre, Guy; and Durel, Jean M., 4,440,875, Cl. 518-728.000.

Dussault, Jean A., to Western Electric Company, Inc. Apparatus for testing digital and analog circuits. 4,441,183, Cl. 371-25.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Franz, Arnold; and Koepnick, Siegfried, 4,440,833, Cl. 428-425.100.

E.C.H. Will (GmbH & Co.): *See*—
Aykut, Kurt, 4,440,051, Cl. 83-72.000.

Eastman Kodak Company: *See*—
Bailey, David B.; and Abel, Edward P., 4,440,848, Cl. 430-215.000.
Barbee, Robert B.; and Wicker, Thomas H., Jr., 4,440,922, Cl. 528-194.000.
Cook, Mary J.; and Hyche, Kenneth W., 4,440,888, Cl. 524-139.000.
Pollock, Mark A.; and Fleenor, Jimmie D., 4,440,664, Cl. 252-188.310.

Eaton Corporation: *See*—
Claydon, David R., 4,440,274, Cl. 188-328.000.
Foxton, Robert J.; Kappheim, David A.; and Holmes, Russell C., 4,440,037, Cl. 74-331.000.
Martin, Barrie J., 4,440,344, Cl. 239-102.000.
Nat, Gursharan P. S., 4,440,994, Cl. 200-42.00T.
Oehlke, Donald N., 4,440,535, Cl. 411-112.000.

Ebata, Yoshikazu: *See*—
Nomoto, Reishi; Takahashi, Masayoshi; and Ebata, Yoshikazu, 4,440,171, Cl. 128-335.500.

Ebel, Mark S., to National Semiconductor Corporation. Semiconductor memory core program control circuit. 4,441,172, Cl. 365-226.000.

Eberly, Paul E., Jr.: *See*—
Baird, William C., Jr.; Eberly, Paul E., Jr.; and Balinsky, George J., 4,440,667, Cl. 502-53.000.

Echte, Adolf: *See*—
Brandstetter, Franz; Hambrecht, Juergen; and Echte, Adolf, 4,440,906, Cl. 525-68.000.

Echtler, J. Paul, to Conoco Inc. Method for stabilizing a slurry of finely divided particulate solids in a liquid. 4,440,543, Cl. 44-51.000.

Eckert, Alton B., Jr.: *See*—
Baun, Danilo P.; and Eckert, Alton B., Jr., 4,441,197, Cl. 377-15.000.

Eckert, Konrad, to Robert Bosch GmbH. Internal combustion engine. 4,440,124, Cl. 123-261.000.

Eckert, Rolf, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method of producing similar deep-drawn parts. 4,440,337, Cl. 228-173.00C.

Eddleman, Roy T., to Spectrum Medical Industries, Inc. Clamp. 4,439,901, Cl. 24-248.00B.

Edgar, Richard H.: *See*—
Eves, E. Eugene, II; and Edgar, Richard H., 4,441,003, Cl. 219-10.55A.

Edhlund, Ronald D., to American Photo-Graphics Corporation. Pressure-sensitive transfer sheets with opaque pigment layer. 4,440,842, Cl. 430-11.000.

Edmundson, Henry N.: *See*—
Boutemy, Yves L.; and Edmundson, Henry N., 4,440,020, Cl. 73-152.000.

Edwards, Bryant; Krogman, Stanley R.; and McArdle, Edward J., to Illinois Tool Works Inc. Plant transfer mechanism. 4,440,101, Cl. 111-2.000.

Effenberger, Franz; and Zoller, Gerhard, to Degussa Aktiengesellschaft. 2-Azido-3-benzyloxy-propionic acid-benzyl ester, process for its production and its use. 4,440,686, Cl. 260-34.000.

Egg Marketing Board, The: *See*—
MacKenzie, Kenneth A., 4,440,791, Cl. 426-43.000.

Egolf, Daniel Lee: *See*—
Hunter, Gray H., 4,440,059, Cl. 84-464.00R.

Ehrman, Charles R.; Killgo, Ronald W.; and Piper, Paul P., Jr., to Piper Industries, Inc. Nestable and stackable basket assembly. 4,440,302, Cl. 206-506.000.

Eichelberger, Charles W.; Wojnarowski, Robert J.; and Ryckman, William D., Jr., to General Electric Company. Cooking apparatus employing a rotisserie mode with stationary food. 4,441,015, Cl. 219-411.000.

Eidem, Penny K., to Chevron Research Company. Air blowing asphalt using sulfonic acid catalyst. 4,440,579, Cl. 106-274.000.

Eitel, Frederick G., to United States of America, Army. Laser power meter. 4,440,506, Cl. 374-32.000.

Elder, James Donald: *See*—
Bergeron, Hervin J., Jr., 4,440,343, Cl. 237-69.000.

Electric Power Research Institute, Inc.: *See*—
Davis, William D., 4,441,073, Cl. 324-52.000.
Harrold, Ronald T., 4,440,971, Cl. 174-17.0GF.

Elhaus, Friedrich W. Traveling saw with a sound protection hood. 4,440,054, Cl. 83-390.000.

Elho International B.V.: *See*—
Wijsman, Dirk W., 4,440,371, Cl. 248-318.000.

Eli Lilly and Company: *See*—
McCormick, Mack H.; and Wild, Gene M., 4,440,753, Cl. 424-124.000.
Seno, Eugene T.; and Baltz, Richard H., 4,440,857, Cl. 435-118.000.

Elliott, James M.; Rickel, Eric A.; and Rickel, Terri F. Electrical plug connector lock. 4,440,465, Cl. 339-75.00P.

Elliott, Larry E. Tape measure. 4,439,927, Cl. 33-189.000.

Ellison, Michael J.: *See*—
Goodell, Fred L.; and Ellison, Michael J., 4,440,451, Cl. 301-105.00R.

El-Sheikh, Kamal, to Kelsey Hayes Company. Disc brake. 4,440,267, Cl. 188-73.350.

Eltec Instruments, Inc.: *See*—
Doctor, Alan P.; and Oettel, Friedrich H., 4,441,023, Cl. 250-338.000.

Emhart Industries, Inc.: *See*—
Wallace, George E., 4,439,993, Cl. 62-82.000.

Emmel, Henry J.: *See*—
Clark, James A.; and Emmel, Henry J., 4,440,317, Cl. 222-103.000.

Energy Conversion Devices, Inc.: *See*—
Doehler, Joachim; Cannella, Vincent; and Gray, Richard O., Jr., 4,440,107, Cl. 118-718.000.
Madan, Arun, 4,441,113, Cl. 357-2.000.

Energy Recovery Group, Inc.: *See*—
Adams, Jack C., 4,440,098, Cl. 110-215.000.

Engelder, Paul D., to AMF Inc. Thermally isolated well instruments. 4,440,219, Cl. 166-57.000.

Engelhard Corporation: *See*—
Thompson, Charles E., 4,440,874, Cl. 502-327.000.

Engelsmann, Dieter: *See*—
Linke, Gerda; Engelsmann, Dieter; Maas, Dieter; Bassler, Alfred; and Hackenberg, Hubert, 4,440,483, Cl. 354-212.000.

Enger, Thomas A.: *See*—
Bullions, Robert J., III; and Enger, Thomas A., 4,441,153, Cl. 364-200.000.

Engineering Resources Development Office: *See*—
Tomikawa, Kouichi; and Takahashi, Hiroshi, 4,440,499, Cl. 366-3.000.

England, Christopher: *See*—
Lawson, Daniel D.; and England, Christopher, 4,440,733, Cl. 423-437.000.

Ennis, James: *See*—
Van Buskirk, E. James; and Ennis, James, 4,440,306, Cl. 215-230.000.

Ensotech, Inc.: *See*—
Sabherwal, Inderjit H., 4,440,867, Cl. 502-62.000.

Entropy Dynamics: *See*—
McCarthy, Walton W., 4,440,861, Cl. 435-306.000.

Environmental Products Corporation: *See*—
DeWoolfson, Bruce H., 4,440,284, Cl. 194-4.00R.

Environmental Research Institute of Michigan: *See*—
Lougheed, Robert M.; and Mudge, Trevor N., 4,441,207, Cl. 382-8.000.

Envirotech Corporation: *See*—
Grant, David, 4,439,938, Cl. 37-117.500.

Erdelyi, Janos: *See*—
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; Muller, Henrik; Nyiro, Katalin; and Takacs, Ferenc, 4,440,619, Cl. 204-401.000.

Erickson, Edward G., to GTE Products Corporation. Electronically switchable multiwavelength laser system. 4,441,186, Cl. 372-19.000.

Erickson, Raymond A.: *See*—
Maldonado, Robert; and Erickson, Raymond A., 4,440,485, Cl. 354-322.000.

Ericson, Kurt S. B. Devices used for the connection of pipes. 4,440,406, Cl. 277-207.00A.

Eriss, Lawrence: *See*—
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Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, to Hoechst Aktiengesellschaft. Process for purifying and recovering contaminated catalyst solution obtained in the carbonylation of methyl acetate and/or dimethylether. 4,440,570, Cl. 75-121.000.

Erwin Kampf GmbH & Co.: *See*—
Lang, John C., 4,440,356, Cl. 242-56.500.

Esbel Residual Energy for Cooling and Heating Ltd.: *See*—
Vardi, Isaih; Kimchi, Yigal; and Ben-Dror, Jonathan, 4,440,001, Cl. 62-475.000.

Esper, Norbert: *See*—
Burba, Christian; Goeke, Ulrich; and Esper, Norbert, 4,440,900, Cl. 524-569.000.

Estel Hoesch Werke AG: *See*—
Brand, Werner, 4,440,363, Cl. 244-114.00R.

Etablissements F. Valentin: *See*—
Montoriol, Bernard, 4,440,199, Cl. 140-71.00R.

Etablissements le Simplex: *See*—
Juy, Henry, 4,440,440, Cl. 297-195.000.

Ethicon, Inc.: *See*—
Golden, Donald; and Duncan, Robert B., 4,440,170, Cl. 128-325.000.
Mattei, Frank V.; and Doddi, Namassivaya, 4,440,789, Cl. 424-78.000.

Ethyl Corporation: *See*—
Chen, Jackson C.; Baylerian, Marguerite S.; Davis, Bryan T.; and Rifkin, Ellis B., 4,440,659, Cl. 252-51.50A.
Ihrman, Kryn G., 4,440,952, Cl. 564-305.000.
Weidig, Charles F., 4,440,545, Cl. 44-56.000.

Evanchuk, Vincent L., to California Institute of Technology. Optical analog-to-digital converter. 4,441,096, Cl. 340-347.0AD.

Evans, Alfred: *See*—
Raasakka, Benny O.; and Evans, Alfred, 4,439,957, Cl. 52-79.100.

Evans, David: *See*—
Blackwood-Murray, Thomas J.; and Evans, David, 4,440,295, Cl. 198-843.000.

Evans, Harmon A., to Westinghouse Electric Corp. Retort pipe seal. 4,440,384, Cl. 266-149.000.

Evans, John L., to Exxon Production Research Co. Method and apparatus for controlling the flow of drilling fluid in a wellbore. 4,440,239, Cl. 175-5.000.

Evans, William E.; and Gillett, Jimmie D., to Varo, Inc. Missing pulse detector for a synchronous motor drive. 4,441,062, Cl. 318-703.000.

Everett, Colvin K. Tree delimber. 4,440,202, Cl. 144-2.00Z.

Everpure, Inc.: *See*—
DeVale, Donald P.; and Wieser, Joseph, 4,440,200, Cl. 141-95.000.

Ever, E. Eugene, II; and Edgar, Richard H., to Raytheon Company. Conveyorized microwave oven with multiple lanes. 4,441,003, Cl. 219-10.55A.

Evseev, Anatoly K.: *See*—
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EVVA-Werk Specialerzeugung von Zylinder-und-Sicherheitsschlossern GmbH & Co. KG: *See*—
Prunbauer, Kurt, 4,440,007, Cl. 70-276.000.

Excelermatic Inc.: *See*—
Kraus, Charles E., 4,440,043, Cl. 74-798.000.

Exxon Production Research Co.: *See*—
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Exxon Research and Engineering Co.: *See*—
Baird, William C., Jr.; Eberly, Paul E., Jr.; and Balinsky, George J., 4,440,667, Cl. 502-53.000.
Grenoble, Dane C.; Kim, Chang J.; and Murrell, Lawrence L., 4,440,872, Cl. 502-242.000.
Holzwarth, George M., 4,440,225, Cl. 166-246.000.
Horowitz, Harold S.; and Lewandowski, Joseph T., 4,440,670, Cl. 252-518.000.
Markley, Gerald E., 4,440,627, Cl. 208-65.000.
Metro, Stephen J.; and Carr, Dale D., 4,440,657, Cl. 252-49.900.
Mitchell, Howard L., 4,440,634, Cl. 208-310.00R.
Stein, Alexander, 4,440,510, Cl. 374-169.000.
Winter, William E.; and Markley, Gerald E., 4,440,626, Cl. 208-65.000.
Winter, William E.; and Markley, Gerald E., 4,440,628, Cl. 208-65.000.

Eyb, Wolfgang, to Dr. Ing. h.c.F. Porsche AG. Bumper for a motor vehicle, in particular a passenger car. 4,440,429, Cl. 293-120.000.

Faber, Peter, to Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft. Method of making a composite electrode. 4,439,916, Cl. 29-623.400.

Facoetti, Hugues; Mesoret, Philippe; Micheron, Francois; Petit, Patrick; and Ravinet, Pierre, to Thomson-CSF. Electro-acoustic transducer with active dome. 4,440,983, Cl. 179-110.00A.

Fag Kugelfischer Georg Schafer & Co.: *See*—
Sauer, Herbert; and Gutlein, Gunter, 4,440,275, Cl. 188-352.000.

Fahrion, Karl. Duct connector. 4,440,426, Cl. 285-239.000.

Fain, Norman M.: *See*—
Buchan, Walter; Cardin, Paul P.; and Fain, Norman M., 4,440,818, Cl. 428-99.000.

Fairchild Camera & Instrument Corporation: *See*—
Milgram, Alvin, 4,440,804, Cl. 427-91.000.

Fairchild Industries, Inc.: *See*—
Collurafici, Francisco A.; and Lee, Ralph L., 4,440,431, Cl. 294-27.00H.
Marrujo, Ralph G.; and Cooper, Adrianus A. G., 4,440,441, Cl. 297-216.000.

Fairfield Industries, Inc.: *See*—
Ray, Clifford H.; and Moore, Neil A., 4,441,174, Cl. 367-23.000.

Faith, Thomas J., Jr., to RCA Corporation. Monitor for impurity levels in aluminum deposition. 4,440,799, Cl. 427-8.000.

Farley, David L., to Completion Services, Inc. Slurry up particulate placement tool. 4,440,218, Cl. 166-51.000.

Farm Fresh Shrimp Corporation: *See*—
Dugan, Charles; and Dugan, Timothy, 4,440,109, Cl. 119-2.000.

Farrow, Gerald: *See*—
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Faucher, Joseph A. Hair care compositions. 4,440,743, Cl. 424-70.000.

Fawn Engineering Co.: *See*—
Wittern, Francis A.; and Wirstlin, Arthur N., 4,440,285, Cl. 194-93.000.

Fawzi, Mahdi B.; Benedict, James J.; Bugaj, Joseph E.; Degenhardt, Charles R.; and Van Duzee, Barry F., to Mallinckrodt, Inc. Stable radiographic imaging agents. 4,440,738, Cl. 424-1.100.

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Federico, Joseph; and Waaben, Sigurd G., to Bell Telephone Laboratories, Incorporated. Apparatus for determining the location of faults in a transmission line. 4,440,985, Cl. 179-175.30F.

Fedorov, Alexandr A.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.

Fedorov, Nikolai A.: *See*—
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Fedotov, Mikhail T.: *See*—
Albertinsky, Boris I.; Dmitrieva, Nina M.; Evseev, Anatoly K.; Zotov, Ivan P.; Ivanov, Andrei S.; Sviniin, Mikhail P.; Suslov, Valentin A.; and Fedotov, Mikhail T., 4,441,150, Cl. 363-126.000.

Feiss, Stephen W., to Fypon Inc. Bay window panel joint. 4,439,963, Cl. 52-201.000.

Feldhoff, Horst: *See*—
Vielstich, Gunther; Bauer, Hanns-Georg; Muhlenbeck, Josef; Otto, Josef; Feldhoff, Horst; Zollner, Dieter H.; and Rittmann, Friedrich, 4,441,190, Cl. 373-94.000.

Feldmann, Hugo; Hollmann, Friedrich; Beisemann, Gerd; and Gartner, Horst, to SMS Schloemann-Siemag AG. Rolling stand with noncylindrical rolls. 4,440,012, Cl. 72-201.000.

Feldstein, Nathan. Stabilized dispersion for electroless plating catalysts using corrosion inhibitors as stabilizers. 4,440,805, Cl. 427-97.000.

Felger, Gunter; Glockler, Otto; Kauff, Helmut; Kiencke, Uwe; Knapp, Heinrich; and Stocker, Herbert, to Robert Bosch GmbH. Regulating device for a fuel metering system. 4,440,131, Cl. 123-440.000.

Felton, Willard B. Resource efficient water power prime mover. 4,440,427, Cl. 290-54.000.

Ferber, Gerald J.; and Goddard, Peter J., to Bush Boake Allen. Production of indanes. 4,440,966, Cl. 585-415.000.

Fernandes, Peter M.; and Lundblad, John L., to Cutter Laboratories, Inc. Pasteurized therapeutically active protein compositions. 4,440,679, Cl. 260-122.000.

Fernandez, Isabel F.: *See*—
Bose, Ajay K.; Fernandez, Isabel F.; and Gala, Kanti J., 4,440,682, Cl. 260-239.00A.

Ferrin, Wayne: *See*—
Boosalis, Michael G., deceased; Boosalis, George M.; and Ferrin, Wayne, 4,440,071, Cl. 99-339.000.

Fette, Bruce; Gibson, Rose M.; and McCabe, Donald P., to Motorola Inc. Digital voice processing system. 4,441,200, Cl. 381-36.000.

Fiat Auto S.p.A.: *See*—
Burgio di Aragona, Antonio, 4,440,348, Cl. 239-533.120.
Milana, Emilio, 4,440,496, Cl. 356-241.000.

Fichet-Bauche: *See*—
Guiraud, Francois, 4,440,010, Cl. 70-409.000.

Fichtel & Sachs AG: *See*—
Hauguth, Hubert, 4,440,281, Cl. 192-48.800.

Fiddler, Maurice K. Portable sun shelter. 4,440,187, Cl. 135-117.000.

Fiebelkorn, Kenneth L.: *See*—
ReuBoin, Rudolph; and Fiebelkorn, Kenneth L., 4,439,899, Cl. 24-458.000.

Figwer, Eduard; and Schmitzberger, Franz, to Oesterreichische Salen-Kunststoffwerk Gesellschaft m.b.H. Sprinkler. 4,440,345, Cl. 239-214.000.

Finkenor, Lawrence E.: *See*—
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Finney, Harold T., II, to Mattel, Inc. Graphic effects generator. 4,441,104, Cl. 340-724.000.

Firestone Tire & Rubber Company, The: *See*—
Hergenrother, William L.; and Doshak, John M., 4,440,889, Cl. 524-143.000.

Fischell, Robert E.; Fountain, Glen H.; and Blackburn, Charles M., to Johns Hopkins University, The. Self-injurious behavior inhibiting system. 4,440,160, Cl. 128-132.00R.

Fischer, Jurgen: *See*—
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Fischer, Peter; Rauthmann, Axel; and Pietryk, Erwin, to Ford Motor Company. Wiper arm with washer nozzle for motor vehicle windows. 4,439,887, Cl. 15-250.040.

Fisher, Edwin N., to Atlantic Richfield Company. Ice aggregate road and method and apparatus for constructing same. 4,440,520, Cl. 404-72.000.

Fister, Julius C.; and Breedis, John F., to Olin Corporation. Composite copper nickel alloys with improved solderability shelf life. 4,441,118, Cl. 357-70.000.

Fix, Joseph A.; and Pogany, Stefano A., to Merck & Co., Inc. α-Keto aldehydes as enhancing agents of gastro-intestinal drug absorption. 4,440,740, Cl. 424-1.100.

Flagg, Edward E., to Dow Chemical Company, The. Phenoxiodinin-5-ium antimicrobial compounds. 4,440,943, Cl. 560-65.000.

Flagg, Rodger H. Heat dispersing thermal barrier. 4,440,342, Cl. 237-50.000.

Flanagan, Joseph E.: *See*—
Witucki, Edward F.; and Flanagan, Joseph E., 4,440,687, Cl. 260-349.000.

Flanigen, Edith M.: *See*—
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 4,440,871, Cl. 502-214.000.

Flannery, James E.; Mach, Joseph F.; and Wexell, Dale R., to Corning Glass Works. Hydraulic cements prepared from glass powders. 4,440,576, Cl. 106-85.000.

Fleenor, Jimmie D.: *See*—
Pollock, Mark A.; and Fleenor, Jimmie D., 4,440,664, Cl. 252-188.310.

Fleming, Mark C. Music speech filter. 4,441,203, Cl. 381-110.000.

Fletcher, Ansel T.: *See*—
Hunt, Harlley L.; and Fletcher, Ansel T., 4,440,262, Cl. 182-114.000.

Fletcher, Charles W.: *See*—
Dieckmann, Dale J.; and Fletcher, Charles W., 4,440,674, Cl. 524-177.000.

Fletcher, Robert P.; and Martin, Daniel B., to International Business Machines Corporation. Page controlled cache directory addressing. 4,441,155, Cl. 364-200.000.

Fliri, Hans; and Hamberger, Helmut, to Sandoz Ltd. Derivatives of cephalosporanic acid, processes for their production and their use. 4,440,767, Cl. 424-246.000.

FMC Corporation: *See*—
Fretz, Edward R., Jr.; and Green, Joseph, 4,440,944, Cl. 560-76.000.

Fochler, Helmut P.: *See*—
Pate, Harold T.; and Fochler, Helmut P., 4,440,425, Cl. 285-161.000.

Focht, Louis R., to Ford Motor Company. Velocity and mass air flow sensor. 4,440,027, Cl. 73-861.240.

Fogel, Sidney J.: *See*—
Katz, Jerome; and Fogel, Sidney J., 4,440,601, Cl. 203-24.000.

Fogelman, H. Frank; and Ambrose, Arnum, to Sega Electronics, Inc. Universal electronic video game cabinet. 4,440,457, Cl. 312-7.200.

Foley, Lary L., to Clorox Company, The. Controlled delivery of immiscible materials into an aqueous system. 4,440,542, Cl. 8-523.000.

Folmsbee, Alan C.; Kokkonen, Kim; and Spaw, William J., to Intel Corporation. Memory redundancy apparatus for single chip memories. 4,441,170, Cl. 365-200.000.

Foo, Peter. Scale modelling. 4,440,813, Cl. 428-15.000.

Foote Mineral Company: *See*—
Staggers, John O.; Banerji, Samir K.; and Lalich, Michael J., 4,440,568, Cl. 75-53.000.

Forcier, Mitchell D. Daisy wheel printer having low mass carriage. 4,440,512, Cl. 400-144.200.

Ford Motor Company: *See*—
Chan, Uck I., 4,441,008, Cl. 219-121.0LL.
Fischer, Peter; Rauthmann, Axel; and Pietryk, Erwin, 4,439,887, Cl. 15-250.040.
Focht, Louis R., 4,440,027, Cl. 73-861.240.

Forker, Ray B., Jr., to Corning Glass Works. Method for decorating low-expansion ceramic articles. 4,440,810, Cl. 427-376.200.

Forster, Helmut: *See*—
Berkes, Klaus; Forster, Helmut; Huth, Wolfgang; Ritschel, Gunter; Schebiella, Georg; Scholz, Norbert; and Thomas, Frank-Gerhard, 4,440,797, Cl. 426-613.000.

Forster, Siegfried; Schindler, Stefan R.; and Pohlmann, Hans-Jurgen, to Kernforschungsanlage Julich GmbH; and Rosenthal Technik AG. Connecting system for ceramic components of a burner and/or heating device. 4,440,113, Cl. 122-16.000.

Foulk, Donald H., to Dana Corporation. Slip clutch speed change mechanism. 4,440,035, Cl. 74-89.150.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See*—
Masumoto, Hakaru; and Murakami, Yuetsu, 4,440,720, Cl. 420-459.000.

Fountain, Glen H.: *See*—
Fischell, Robert E.; Fountain, Glen H.; and Blackburn, Charles M., 4,440,160, Cl. 128-132.00R.

Fox, Daniel W.; Kaduk, Bruce A.; and Starr, John B., Jr., to General Electric Company. Copolymers of polyarylates with polyethylene arylates and process for their preparation. 4,440,912, Cl. 525-439.000.

Foxton, Robert J.; Kappheim, David A.; and Holmes, Russell C., to Eaton Corporation. Shift control. 4,440,037, Cl. 74-331.000.

Fracker, Clarence E., Jr.: *See*—
Morrison, Michael W.; Fracker, Clarence E., Jr.; and Marra, Jerome F., 4,440,557, Cl. 65-3.100.

Framatome: *See*—
Lecomte, Jean-Claude, 4,441,078, Cl. 324-219.000.

Franz, Arnold; and Koepnick, Siegfried, to Dynamit Nobel Aktiengesellschaft. Copper-laminated hard paper made of a fire resistant laminate. 4,440,833, Cl. 428-425.100.

Franz, Klaus-Dieter: *See*—
Naarmann, Herbert; Penzien, Klaus; Muench, Volker; and Franz, Klaus-Dieter, 4,440,693, Cl. 260-439.00R.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See*—
Schmidt, Helmut; and Kaiser, Alfred, 4,440,745, Cl. 424-78.000.

Frederiksen, Nils: *See*—
Claas, Helmut; and Frederiksen, Nils, 4,440,416, Cl. 280-473.000.

Fredrikson, Bengt; and Hans, Bertil, to Asea AB. Apparatus for heating a continuous flow of molten metal. 4,441,191, Cl. 373-161.000.

Freedman, George: *See*—
Teich, Wesley W.; Freedman, George; and Adamski, Joseph R., 4,441,002, Cl. 219-10.55B.

Freeman, Amihay: *See*—
Golstein, Leon; Sokolovsky, Mordechai; and Freeman, Amihay, 4,440,903, Cl. 525-54.100.

Freiborg, Bennie. Asphalt composition hip and ridge cover. 4,439,955, Cl. 52-57.000.

Frenkel, Valery Y.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.

Frese, Elmar; and Koch, Gerhard, to Mannesmann Aktiengesellschaft; and Mayfran GmbH. Separating and cleaning apparatus for cooling lubricant. 4,440,642, Cl. 210-387.000.

Fretz, Edward R., Jr.; and Green, Joseph, to FMC Corporation. Fire retardant epoxy resins containing 3-hydroxyalkylphosphine oxides. 4,440,944, Cl. 560-76.000.

Friedrich Deckel Aktiengesellschaft: *See*—
Kagerer, Franz, 4,440,050, Cl. 82-21.00B.

Friends, Gary D.: *See*—
Chromecek, Richard C.; Friends, Gary D.; Wissman, Lawrence Y.; and Yourd, Raymond A., III, 4,440,919, Cl. 526-263.000.

Frohbieter, Edwin H., to Whirlpool Corporation. Binary refrigerant system with expansion valve control. 4,439,996, Cl. 62-174.000.

Fruchtnicht, Ocke C.: *See*—
Thompson, Richard J.; and Fruchtnicht, Ocke C., 4,440,587, Cl. 156-154.000.

Frudakis, Rosalie. Method for encouraging self improvement. 4,440,396, Cl. 273-242.000.

Fryer, Rodney I.: *See*—
Walser, Armin; and Fryer, Rodney I., 4,440,685, Cl. 260-245.600.

Fuji Foods Industry Co., Ltd.: *See*—
Seki, Masao, 4,440,793, Cl. 426-549.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Yamakawa, Toru, 4,439,989, Cl. 60-718.000.

Fuji Kasei Co., Ltd.: *See*—
Takeuchi, Shoji; Nishiyama, Kozaburo; and Gomi, Tadashi, 4,440,661, Cl. 252-89.100.

Fuji Photo Film Co., Ltd.: *See*—
Ochi, Shigeharu, 4,441,123, Cl. 358-44.000.

Fuji Seiki Machine Works, Ltd.: *See*—
Watanabe, Mitsuru, 4,441,059, Cl. 318-39.000.

Fuji Xerox Co., Ltd.: *See*—
Kataoka, Hiroyuki; and Arai, Yoshio, 4,440,513, Cl. 400-165.100.
Sekimoto, Souichi, 4,440,473, Cl. 350-342.000.
Toyoshima, Toshihiko, 4,441,111, Cl. 346-154.000.

Fujii, Takayoshi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,440,757, Cl. 424-180.000.

Fujii, Yasuhiro: *See*—
Sugiura, Shinji; Fujii, Yasuhiro; Sato, Katsunori; Nezu, Tuguo; and Okumura, Yasumasa, 4,440,913, Cl. 525-443.000.

Fujikake, Shiro; Kawamata, Motoo; and Tsuboi, Hikotada, to Mitsui Toatsu Chemicals, Inc. Aromatic polyesters. 4,440,920, Cl. 528-128.000.

Fujimori, Noboru: *See*—
Onishi, Akira; and Fujimori, Noboru, 4,440,852, Cl. 430-522.000.

Fujimori, Shinichiro: *See*—
Nitta, Isei; Fujimori, Shinichiro; Haruyama, Toshio; and Inoue, Shinya, 4,440,689, Cl. 260-397.400.
Fujioka, Kazuyoshi: *See*—
Ishimaru, Wataru; and Fujioka, Kazuyoshi, 4,440,282, Cl. 192-70.200.
Fujisaki, Shigemi; Fujisaki, Takashi; Yoshida, Junichi; and Fujisaki, Yasuhiro, to Kaken Pharmaceutical Co., Ltd. Preventive and treating agent for blood lipids abnormality and/or arteriosclerosis. 4,440,749, Cl. 424-94.000.
Fujisaki, Takashi: *See*—
Fujisaki, Shigemi; Fujisaki, Takashi; Yoshida, Junichi; and Fujisaki, Yasuhiro, 4,440,749, Cl. 424-94.000.
Fujisaki, Yasuhiro: *See*—
Fujisaki, Shigemi; Fujisaki, Takashi; Yoshida, Junichi; and Fujisaki, Yasuhiro, 4,440,749, Cl. 424-94.000.
Fujisawa, Kyuichi, to Alps Electric Co., Ltd. Pen type recording device. 4,441,109, Cl. 346-139.00R.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Nakai, Yoshiharu; and Sakane, Kazuo, 4,440,766, Cl. 424-246.000.
Fujitsu Limited: *See*—
Shiho, Masahiko; and Sato, Yasunori, 4,440,820, Cl. 428-120.000.
Fujiwara, Takashi; Kajita, Shuji; Matsushita, Tetsuo; and Manabe, Seiichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of high Young's modulus poly-p-phenylene-terephthalamide. 4,440,710, Cl. 264-184.000.
Fukukita, Hiroshi: *See*—
Hayakawa, Yoshihiro; Yano, Tsutomu; Tachita, Ryobun; Fukukita, Hiroshi; Irioka, Kazuyoshi; and Fukumoto, Akira, 4,440,025, Cl. 73-642.000.
Fukumoto, Akira: *See*—
Hayakawa, Yoshihiro; Yano, Tsutomu; Tachita, Ryobun; Fukukita, Hiroshi; Irioka, Kazuyoshi; and Fukumoto, Akira, 4,440,025, Cl. 73-642.000.
Fukushima, Masao; and Yazaki, Komei, to Nissan Motor Company, Limited. Engine mounting structure for automotive vehicle. 4,440,375, Cl. 248-559.000.
Funakoshi, Takashi: *See*—
Kawahara, Haruyuki; Makita, Teruo; Kudo, Shozo; and Funakoshi, Takashi, 4,440,878, Cl. 523-116.000.
Furukawa, Toshihiko, to Sodick Co., Ltd. EDM Pulse generator with a variable output inductor for producing pulse with gradually rising edges. 4,441,005, Cl. 219-69.00C.
Fypon Inc.: *See*—
Feiss, Stephen W., 4,439,963, Cl. 52-201.000.
G. D. Searle & Co.: *See*—
Dryden, Hugh L.; and Hill, John B., 4,440,677, Cl. 260-112.50R.
G. Dusterloh GmbH: *See*—
Klie, Jurgen; and Stoll, Hans-Wolfgang, 4,440,067, Cl. 91-491.000.
Gaeddert, Melvin V., to Hesston Corporation. Round baler having wrapping twine cutter. 4,440,075, Cl. 100-5.000.
Gaertner, Gregory E.; and Wu, Ta-Ming, to Burroughs Corporation. Internally gated variable pulsewidth clock generator. 4,441,037, Cl. 307-265.000.
Gagas, Michael. Manhole cover gasket seal. 4,440,407, Cl. 277-212.00F.
Gahle, Hans-Juergen, to ITT Industries, Inc. Method of fabricating an integrated bipolar planar transistor by implanting base and emitter regions through the same insulating layer. 4,440,580, Cl. 148-1.500.
Gajek, Richard T.: *See*—
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 4,440,871, Cl. 502-214.000.
Gala, Kanti J.: *See*—
Bose, Ajay K.; Fernandez, Isabel F.; and Gala, Kanti J., 4,440,682, Cl. 260-239.00A.
Gallagher-Kaiser Corp.: *See*—
Perry, Geoffrey A., 4,440,554, Cl. 55-241.000.
Galloway, John L., to Racal Security Limited. Electrical circuits. 4,441,100, Cl. 340-518.000.
Galuska, Charles W. Universal magnetic angled strainer. 4,440,639, Cl. 210-222.000.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,440,775, Cl. 424-269.000.
Gappa, Gunther; Degel, Josef; and Juntgen, Harald, to Bergwerksverband GmbH. Method and apparatus for thermal treatment, especially drying, of finely comminuted bulk material. 4,439,932, Cl. 34-57.00D.
Garofalo, Giovanni, to AMF Inc. Underwater flashlight. 4,441,142, Cl. 362-158.000.
Gartner, Eberhard: *See*—
Greiner, Joachim; and Gartner, Eberhard, 4,440,106, Cl. 118-640.000.
Gartner, Horst: *See*—
Feldmann, Hugo; Hollmann, Friedrich; Beisemann, Gerd; and Gartner, Horst, 4,440,012, Cl. 72-201.000.
Garzon, Ruben D., to Brown Boveri Electric Inc. Puffer interrupter with arc energy assist. 4,440,997, Cl. 200-148.00A.
Gebelius, Sven R. V. Method to distribute wear from passing vehicles over a road surface. 4,440,521, Cl. 404-72.000.
Gehrmann, Klaus: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,440,570, Cl. 75-121.000.
Gelfand, Daniel. Mat cutting device. 4,440,055, Cl. 83-525.000.
Gellert, Jobst U. Heater installation in molding members. 4,439,915, Cl. 29-611.000.
Gemmill, Robert M., Jr.; and Horodysky, Andrew G., to Mobil Oil Corporation. Sulfur-containing mannich bases and lubricants containing same. 4,440,655, Cl. 252-47.500.
Genatempo, Vince; and Karrasch, Frank, to Baxter Travenol Laboratories, Inc. Antibacterial protective cap for connectors. 4,440,207, Cl. 150-52.00R.
General American Transportation Corporation: *See*—
Mowatt-Larssen, Erling; and Davis, Edward L., 4,440,528, Cl. 406-90.000.
General Dental Inc.: *See*—
Houseman, Kenneth R., 4,440,616, Cl. 204-272.000.
General Dynamics Corporation: *See*—
Henslee, Samuel P.; Noronha, Pascal J.; and Logan, John B., 4,440,529, Cl. 408-1.00R.
General Electric Company: *See*—
Barton, Sterling C.; and Pitoniak, Joseph E., 4,440,017, Cl. 73-40.50R.
Bochan, John, 4,440,004, Cl. 68-23.00R.
Cheng, Bo-Ching; and Adamson, Ronald B., 4,440,862, Cl. 436-6.000.
Collins, Clifford B.; and James, William G., 4,441,047, Cl. 313-116.000.
Cutler, John H.; and Walker, Loren H., 4,441,064, Cl. 318-798.000.
Dietz, Peter W.; and Wood, Ralph T., 4,440,350, Cl. 239-703.000.
Eichelberger, Charles W.; Wojnarowski, Robert J.; and Ryckman, William D., Jr., 4,441,015, Cl. 219-411.000.
Fox, Daniel W.; Kaduk, Bruce A.; and Starr, John B., Jr., 4,440,912, Cl. 525-439.000.
Horvay, Julius B.; and Prada, Luis E., 4,439,998, Cl. 62-199.000.
Howard, Robert W., 4,440,719, Cl. 376-372.000.
James, William G., 4,441,046, Cl. 313-112.000.
Levinson, Lionel M., 4,441,094, Cl. 338-21.000.
Levy, Samuel, 4,440,094, Cl. 105-166.000.
McCarty, William J., 4,439,995, Cl. 62-156.000.
Risbeck, James D.; and Cooper, Ernest B., 4,441,012, Cl. 219-137.00R.
Thomas, George L., 4,441,051, Cl. 313-579.000.
Wandler, Richard A.; and Renkes, Kenneth R., 4,440,993, Cl. 200-38.00R.
General Foods Corporation: *See*—
Davies, David L., 4,440,794, Cl. 426-578.000.
General Motors Corporation: *See*—
Baker, Steven F., 4,440,308, Cl. 220-204.000.
Borgen, Robert H.; Reindl, Harold J.; and Pickering, Vernon L., 4,439,909, Cl. 29-453.000.
Butler, Paul E., 4,440,120, Cl. 123-52.0MV.
Case, James L., 4,440,125, Cl. 123-293.000.
Clancy, Terence J.; and Kokochak, David G., 4,440,121, Cl. 123-90.390.
Drouillard, James R.; and Rees, Richard W. A., 4,440,442, Cl. 297-341.000.
Harriott, Paul J., 4,440,269, Cl. 188-196.00F.
Hoffman, James S., 4,440,706, Cl. 264-56.000.
Karlow, James P.; and Hunt, Gary A., 4,441,086, Cl. 330-297.000.
Klusman, Steven A., 4,440,456, Cl. 308-184.00R.
Landenberger, Ulric, 4,440,023, Cl. 73-490.000.
Tsai, Lung-Wen, 4,440,123, Cl. 123-192.00B.
General Technology Applications, Inc.: *See*—
Waters, Paul F.; and Scambos, Thomas T., 4,440,916, Cl. 525-54.200.
Gerace, Michael J.; and Adams, Jeffry D., to Protective Treatments, Inc. Coated bonding tapes having improved peel strength combined with low temperature flexibility. 4,440,829, Cl. 428-343.000.
Gerace, Robert E.: *See*—
Hordon, Monroe J.; and Gerace, Robert E., 4,440,803, Cl. 427-74.000.
Gerchman, Robert D.; Newport, Ronald L.; and van Dyke, Martin J., to Honeywell, Inc. Test unit for aircraft fuel gaging system. 4,441,157, Cl. 364-551.000.
Gerlach, Klaus; Lange, Wolfgang; and Loh, Dieter, to Akzo NV. Process and an apparatus for enriching liquids with oxygen. 4,440,648, Cl. 210-759.000.
Gerritsen, Jan, to U.S. Philips Corporation. Device for measuring and methods for adjusting the convergence of the electron beams in color display tubes. 4,441,120, Cl. 358-10.000.
Gertz, David C. Inlet turbine powered exhaust extractor for internal combustion engines. 4,439,983, Cl. 60-273.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Dettmers, Michael; and Weirich, Walter, 4,440,522, Cl. 405-293.000.
Gibb, William D., to Northern Telecom Limited. Key telephone area voice paging circuit and method. 4,440,989, Cl. 179-99.00P.
Gibbons, Gould: *See*—
Howe, Philip M.; Gibbons, Gould; Aseltine, Clifford L.; and Williams, Frank, 4,440,296, Cl. 206-3.000.
Gibson, Rose M.: *See*—
Fette, Bruce; Gibson, Rose M.; and McCabe, Donald P., 4,441,200, Cl. 381-36.000.
Giddens, Marian S.; and Arnold, Michael B. Convertible top for motorcycles and snowmobiles. 4,440,436, Cl. 296-107.000.
Gil, Pierre: *See*—
Cornu, Jean; Detriche, Jean-Marie; Gil, Pierre; Marchal, Paul; and Vertut, Jean, 4,441,010, Cl. 219-124.340.
Gileta, Vladimir P.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel,

Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.

Gillett, Jimmie D.: *See*—
Evans, William E.; and Gillett, Jimmie D., 4,441,062, Cl. 318-703.000.

Gilmore, Ian J.: *See*—
Clark, Michael T.; and Gilmore, Ian J., 4,440,564, Cl. 71-90.000.

Gimenez-Coronado, Manuel: *See*—
Jacquin, Yves; Gimenez-Coronado, Manuel; and Dai-Nghia, Huynh, 4,440,633, Cl. 208-309.000.

Giorni, Gastone. Container with bristles for cleaning instruments. 4,439,884, Cl. 15-104.920.

Girard, Maurice V.; Worrall, Michael J.; and Seguy, Bernard R., to AMCEC Corporation. Method for reducing peak vapor emissions in solvent recovery systems. 4,440,549, Cl. 55-59.000.

Girgis, Mikhail M., to PPG Industries, Inc. Aqueous, adhesive coating composition with a non-selfcrosslinkable elastomer for use with filamentary materials. 4,440,881, Cl. 523-206.000.

GKN Transmissions Limited: *See*—
Palmer, Bertram J., 4,440,256, Cl. 180-254.000.

Gladwin, Inc.: *See*—
Richardson, Charles T., Jr., 4,441,143, Cl. 362-183.000.

Glaser, Robert L., to L. M. Becker & Co., Inc. Vending machine with front display area. 4,440,312, Cl. 221-24.000.

Glaxo Group Limited: *See*—
Bradshaw, John, 4,440,938, Cl. 549-495.000.

Gleason, John G.; Kinzig, Charles M.; and Bryan, Deborah L., to SmithKline Beckman Corporation. Process for the preparation of esters of leukotriene A. 4,440,939, Cl. 549-548.000.

Gliha, Edward R., Jr.; and Marks, Christopher, to Bendix Corporation, The. Electrical connector having a metallized plastic grounding insert. 4,440,463, Cl. 339-14.00R.

Glockler, Otto: *See*—
Felger, Gunter; Glockler, Otto; Kauff, Helmut; Kiencke, Uwe; Knapp, Heinrich; and Stocker, Herbert, 4,440,131, Cl. 123-440.000.

Glowacki, Julianne; and Pharriss, Bruce B., to Collagen Corporation; and President and Fellows of Harvard College. Osteogenic composition and method. 4,440,750, Cl. 424-95.000.

Go, Ting S. L.; and Miller, Richard F., to Atlantic Richfield Co. Method for minimizing fouling of heat exchanges. 4,440,625, Cl. 208-48.0AA.

Go, Tony S.: *See*—
Miller, Richard F.; Go, Tony S.; and Wilson, George R., III, 4,440,666, Cl. 252-392.000.

Goddard, Peter J.: *See*—
Ferber, Gerald J.; and Goddard, Peter J., 4,440,966, Cl. 585-415.000.

Goeddel, Thomas W.: *See*—
Bass, Steven C.; and Goeddel, Thomas W., 4,440,058, Cl. 84-1.260.

Goeke, Ulrich: *See*—
Burba, Christian; Goeke, Ulrich; and Esper, Norbert, 4,440,900, Cl. 524-569.000.

Gogniat, Paul, to Montres Rado S.A. Watchcase having a thin appearance when being worn. 4,440,505, Cl. 368-292.000.

Goldberg, Richard: *See*—
Kappel, Joseph; and Goldberg, Richard, 4,440,334, Cl. 224-258.000.

Golden, Donald; and Duncan, Robert B., to Ethicon, Inc. Surgical clip applying instrument. 4,440,170, Cl. 128-325.000.

Goldstein, Henry; Hoff, Joseph T.; Cronan, Charles L.; and Rao, Ch. S., to Miller Brewing Company. Process for the preparation of a stable citrus flavored malt beverage. 4,440,795, Cl. 426-592.000.

Goldsworthy Engineering, Inc.: *See*—
Goldsworthy, William B., 4,440,593, Cl. 156-441.000.

Goldsworthy, William B., to Goldsworthy Engineering, Inc. Reinforced plastic composite articles and apparatus and method for producing same. 4,440,593, Cl. 156-441.000.

Golstein, Leon; Sokolovsky, Mordechai; and Freeman, Amihay, to Ramot University Authority for Applied Research and Industrial Development Ltd. Dihaloisocyanide derivatives of polymers for coupling nucleophiles. 4,440,903, Cl. 525-54.100.

Gomi, Tadashi: *See*—
Takeuchi, Shoji; Nishiyama, Kozaburo; and Gomi, Tadashi, 4,440,661, Cl. 252-89.100.

Gonzalez, Armando: *See*—
Scovill, John P.; Klayman, Daniel L.; Massie, Samuel P.; Grant, Steven D.; Gonzalez, Armando; Morrison, Norman E.; and Dobek, Arthur S., 4,440,771, Cl. 424-258.000.

Gonzalez, Ruben J.: *See*—
Borras, Jaime A.; and Gonzalez, Ruben J., 4,441,098, Cl. 340-365.00R.

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Goodyear Tire & Rubber Company, The: *See*—
Christie, William C., 4,440,018, Cl. 73-146.000.
Kifor, Harry T., 4,440,336, Cl. 227-4.000.

Gordon, Lucas S., to Bentley Laboratories, Inc. Blood oxygenator. 4,440,723, Cl. 422-47.000.

Gordon, Roy G. Non-iridescent glass structures. 4,440,822, Cl. 428-216.000.

Gorin, Everett: *See*—
Lancet, Michael S.; and Gorin, Everett, 4,440,546, Cl. 48-202.000.

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Gosney, Ian: *See*—
Cadogan, John I. G.; Gosney, Ian; and Yaslak, Salih, 4,440,676, Cl. 260-112.50R.

Gosser, Robert B.: *See*—
Lange, William J.; and Gosser, Robert B., 4,440,995, Cl. 200-144.00B.

Goto, Akio: *See*—
Yuji, Soeda; and Goto, Akio, 4,439,976, Cl. 53-403.000.

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Sakurai, Takeichi; Goto, Kiyoshi; Konishi, Hiroo; and Kawai, Tadao, 4,441,032, Cl. 307-82.000.

Gotting, Otto; Hess, Walter; and Nicolai, Franz, to Mannesmann AG. Deburring tool. 4,440,533, Cl. 409-299.000.

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Graham, John M. Corrosive fluid two way check relief valve. 4,440,189, Cl. 137-116.000.

Grant, David, to Envirotech Corporation. Coupling mechanism. 4,439,938, Cl. 37-117.500.

Grant, Steven D.: *See*—
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Grantland, Gary; Montgomery, Hugh S.; Boeckmann, Eduard F. B.; and Woodworth, Larry A., to GTE Automatic Electric Inc. Electronic hold circuit. 4,440,981, Cl. 179-81.00R.

Gray, Richard O., Jr.: *See*—
Doehler, Joachim; Cannella, Vincent; and Gray, Richard O., Jr., 4,440,107, Cl. 118-718.000.

Green, Joseph: *See*—
Fretz, Edward R., Jr.; and Green, Joseph, 4,440,944, Cl. 560-76.000.

Green, Richard L.: *See*—
Potter, Michael A.; and Green, Richard L., 4,440,517, Cl. 403-24.000.

Green, William P.: *See*—
Hattan, Mark, 4,440,149, Cl. 126-425.000.

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Greet 'N Wear, Inc.: *See*—
Halperin, Edward, 4,439,941, Cl. 40-124.100.

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Betts, Edmund D., 4,439,893, Cl. 17-72.000.

Gregory, Reginald; and Westlake, David J., to British Petroleum Company Limited, The. Method for promoting the activity of cation-exchangeable layered clay and zeolite catalysts in proton-catalysed reactions. 4,440,958, Cl. 560-247.000.

Greiner, Joachim; and Gartner, Eberhard, to Agfa-Gevaert Aktiengesellschaft. Magnetic orientation system. 4,440,106, Cl. 118-640.000.

Grenoble, Dane C.; Kim, Chang J.; and Murrell, Lawrence L., to Exxon Research and Engineering Co. Transition metal oxide acid catalysts. 4,440,872, Cl. 502-242.000.

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Widmer, Walter R.; and Baschong, Marcel, 4,441,095, Cl. 340-347.0DD.

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Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.

Grob, Robert J., to Caterpillar Tractor Co. Split rim with axially located split band. 4,440,209, Cl. 152-397.000.

Groh, Allen R.; and Kehl, Joseph D., to Shure Brothers, Inc. Stylus protection mechanism. 4,441,177, Cl. 369-170.000.

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Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; and Becker, Thomas P., 4,441,021, Cl. 250-227.000.

Grover, George M.; and Runyan, James E., to Q-dot Corporation. Heat pipe and method and apparatus for fabricating same. 4,440,215, Cl. 165-104.210.

Grube, Herbert E.: *See*—
Pomplun, William S.; and Grube, Herbert E., 4,440,898, Cl. 524-503.000.

Gruppo Lepetit S.p.A.: *See*—
Nathansohn, Giangiacomo; and Winters, Giorgio, 4,440,764, Cl. 424-241.000.

Gruskovnjak, Cvetka: *See*—
Djordjevic, Nebojsa; Rucman, Rudolf; Jovanovic, Suncica; Bole-Vunduk, Breda; Lavric, Tone; Lavric, Boza; Gruskovnjak, Cvetka; Kocjan, Ana; and Krmelj, Hermina, 4,440,772, Cl. 424-261.000.

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Grantland, Gary; Montgomery, Hugh S.; Boeckmann, Eduard F. B.; and Woodworth, Larry A., 4,440,981, Cl. 179-81.00R.
McGibbon, Gregor D.; and Yu, Kenneth K., 4,440,979, Cl. 179-16.0EA.

GTE Laboratories Incorporated: *See*—
Bellows, Alfred H., 4,440,154, Cl. 126-438.000.
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,440,547, Cl. 51-295.000.

GTE Products Corporation: *See*—
Bay, David L., 4,441,054, Cl. 315-219.000.
Erickson, Edward G., 4,441,186, Cl. 372-19.000.

Guenther, Ernst: *See*—
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst, deceased; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,439,933, Cl. 34-65.000.

Guiraud, Francois, to Fichet-Bauche. Lock and key device. 4,440,010, Cl. 70-409.000.

Gunnell, Thomas J., to Phillips Petroleum Company. Process and apparatus for making rubber covered carbon black pellets. 4,440,807, Cl. 427-221.000.

Gunther, Dieter: *See*—
Willms, Lothar; Mildenberger, Hilmar; Gunther, Dieter; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,440,565, Cl. 71-93.000.

Gutlein, Gunter: *See*—
Sauer, Herbert; and Gutlein, Gunter, 4,440,275, Cl. 188-352.000.

H. B. Fuller Company: *See*—
Jannusch, Leonard C., 4,440,884, Cl. 524-26.000.

H.I.M. Inc.: *See*—
Perla, Henry L., 4,440,525, Cl. 405-186.000.

H. J. Langen & Sons Limited: *See*—
Langen, Marinus J. M., 4,440,294, Cl. 198-838.000.

H. P. Hood Inc.: *See*—
Hoffman, Louis S.; and Kurlander, Susan L., 4,440,311, Cl. 220-306.000.

Haagensen, Darrow E., Jr., to Duke University. Breast cyst fluid protein assay. 4,440,863, Cl. 436-539.000.

Haas, Franz, Jr.: *See*—
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Hackenberg, Hubert: *See*—
Linke, Gerda; Engelsmann, Dieter; Maas, Dieter; Bassler, Alfred; and Hackenberg, Hubert, 4,440,483, Cl. 354-212.000.

Hagihara, Hideaki, to Sharp Kabushiki Kaisha. Spring clutch mechanism. 4,440,280, Cl. 192-36.000.

Haglund, Ingemar B.; and Westerlund, Nils A. L., to Nitro Nobel Aktiebolag. Firing initiating device. 4,440,087, Cl. 102-275.110.

Hahashima, Yoshio: *See*—
Tsuji, Teruji; Hahashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,440,683, Cl. 260-239.00A.

Hahm, Gunter; Pauli, Klaus; and Schleicher, Walter, to Deere & Company. Operator enclosure mounting for a self-propelled harvester. 4,440,437, Cl. 296-190.000.

Haisma, Jan: *See*—
Smid, Albert; and Haisma, Jan, 4,440,699, Cl. 264-1.400.

Halbritter, Klaus: *See*—
Sauer, Wolfgang; Aquila, Werner; Hoffmann, Wolfgang; Brenner, Karl; and Halbritter, Klaus, 4,440,960, Cl. 568-471.000.

Hallgren, Charles G., to Keystone Consolidated Industries, Inc. Rotatable shelf hardware. 4,440,459, Cl. 312-238.000.

Halliburton Company: *See*—
Briscoe, James E.; Harris, Phillip C.; and Penny, Glenn S., 4,440,653, Cl. 252-8.55R.
Butler, William S., 4,440,273, Cl. 188-315.000.
Loftin, Royal E.; and Son, Adelina J., 4,440,649, Cl. 252-8.50C.
Roach, James D.; and Cole, Clinton W., 4,440,404, Cl. 277-124.000.

Hallstrom, Stig, to Aktiebolaget Bofors. Extendable fin. 4,440,360, Cl. 244-3.280.

Haloburdo, Joseph J., Jr.; and Tommasini, Rocco M., to United Technologies Corporation. Detector-transducer for sensing temperatures in an engine. 4,440,508, Cl. 374-144.000.

Halperin, Edward, to Greet 'N Wear, Inc. Card with removable and reusable insert. 4,439,941, Cl. 40-124.100.

Hamamatsu TV Co., Ltd.: *See*—
Takaoka, Hidetugu; and Shimazu, Yuji, 4,441,048, Cl. 313-346.00R.

Hamberger, Helmut: *See*—
Flirl, Hans; and Hamberger, Helmut, 4,440,767, Cl. 424-246.000.

Hambrecht, Juergen: *See*—
Brandstetter, Franz; Hambrecht, Juergen; and Echte, Adolf, 4,440,906, Cl. 525-68.000.

Hamer, Arthur; and Pardoe, Beverley H., to National Research Development Corporation. Vibratory conveyor control arrangement. 4,441,060, Cl. 318-114.000.

Hamilton, James F.: *See*—
Haataja, Bruce A.; Kipela, Tauno B.; Lund, Anders E.; and Hamilton, James F., 4,440,708, Cl. 264-109.000.

Hampshire, Michael J., to Salplex Limited. Switching circuit. 4,441,136, Cl. 361-88.000.

Hanaoka, Masanori: *See*—
Hattori, Tadashi; Ozaki, Tadashi; Ootsuka, Yoshinori; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,440,014, Cl. 73-35.000.

Handrick, Kurt; Kolling, Georg; and Kiedel, Paul, to Bergwerksverband GmbH. Preparation of β-isopropylnaphthalene. 4,440,957, Cl. 585-323.000.

Haneishi, Yasuyuki: *See*—
Komoto, Shinsuke; and Haneishi, Yasuyuki, 4,440,484, Cl. 354-286.000.

Hann, Dallas D. Locomotive air brake system testing device. 4,440,015, Cl. 73-39.000.

Hanna, Charas, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Apparatus for recognition of stylized characters. 4,441,204, Cl. 382-7.000.

Hanna, Daniel C. Vehicle washing apparatus. 4,439,883, Cl. 15-97.00B.

Hans, Bertil: *See*—
Fredrikson, Bengt; and Hans, Bertil, 4,441,191, Cl. 373-161.000.

Hansen, Kenneth P., to United Technologies Corporation. Flow control device. 4,440,191, Cl. 137-468.000.

Haque, Yusuf A., to American Microsystems, Inc. Switched capacitor automatic gain control loop. 4,441,082, Cl. 330-129.000.

Harada, Takashi: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,440,643, Cl. 210-500.200.

Hardel, Joachim: *See*—
Ohorodnik, Alexander; Keuper, Hans W.; Semmler, Horst; Hardel, Joachim; Vierling, Hermann; and Willms, Robert, 4,440,925, Cl. 528-487.000.

Harden, Jerrell W.: *See*—
Brown, William P.; and Harden, Jerrell W., 4,439,948, Cl. 47-1.700.

Harder, Burkhard: *See*—
Henning, Klaus-Dirk; Klein, Jurgen; and Harder, Burkhard, 4,440,551, Cl. 55-73.000.

Hardy, John W., to Itek Corporation. Wavefront sensor with astigmatic optics. 4,441,019, Cl. 250-201.000.

Hardy, Melvin J.: *See*—
Baugh, John L.; and Hardy, Melvin J., 4,440,233, Cl. 166-382.000.

Harriott, Paul J., to General Motors Corporation. Self adjusting parking brake. 4,440,269, Cl. 188-196.00F.

Harris, Phillip C.: *See*—
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Harrold, Ronald T., to Electric Power Research Institute, Inc. Supersaturated vapor dielectrics. 4,440,971, Cl. 174-17.0GF.

Hart, Peter A., to International Computers Ltd. Digital adder circuit for binary-coded numbers of radix other than a power of two. 4,441,159, Cl. 364-771.000.

Hartlaub, Jerome T.: *See*—
Hudziak, Lawrence C.; and Hartlaub, Jerome T., 4,440,173, Cl. 128-419.0PG.

Haruyama, Toshio: *See*—
Nitta, Issei; Fujimori, Shinichiro; Haruyama, Toshio; and Inoue, Shinya, 4,440,689, Cl. 260-397.400.

Harwood, Leopold A.; and Shanley, Robert L., II, to RCA Corporation. Adjustable coring circuit. 4,441,121, Cl. 358-36.000.

Harwood, Leopold A., to RCA Corporation. High voltage protection for an output circuit. 4,441,137, Cl. 361-91.000.

Hase, Alfred M. Multi-voltage transformer input circuits with primary reactor voltage control. 4,441,149, Cl. 363-91.000.

Hasegawa, Akira: *See*—
Takeshima, Kiyoshi; and Hasegawa, Akira, 4,439,898, Cl. 24-401.000.

Hasegawa, Hiroshi: *See*—
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Hasegawa, Isao: *See*—
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Hashiguchi, Yukihide: *See*—
Hattori, Tadashi; Ozaki, Tadashi; Ootsuka, Yoshinori; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,440,014, Cl. 73-35.000.

Hashimoto, Hiroshi: *See*—
Kuze, Katsuaki; Matsuyama, Yuziro; Hashimoto, Hiroshi; Ohta, Takeshi; and Makimura, Osamu, 4,440,924, Cl. 528-275.000.

Hashimoto, Mitsuru, to Ricoh Co., Ltd. Disazo compound, method of making same and electrophotographic element using same. 4,440,845, Cl. 430-57.000.

Hashimoto, Takashi: *See*—
Kojima, Yasuhiko; Konno, Seishi; and Hashimoto, Takashi, 4,440,761, Cl. 424-195.000.

Haskell of Pittsburgh, Inc.: *See*—
Rice, Thomas E.; and Young, Peter T., 4,440,096, Cl. 108-3.000.

Hatakeyama, Siro; Oba, Harutaro; and Ukai, Yoshitaka, to Tokyo Electric Co., Ltd.; and Konishiroku Photo Industry Co., Ltd. Printing head protecting device in ink jet printer. 4,441,110, Cl. 346-140.00R.

Hattan, Mark, to Green, William P., a part interest. Radiation collectors. 4,440,149, Cl. 126-425.000.

Hattori, Tadashi; Ozaki, Tadashi; Ootsuka, Yoshinori; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Knocking detection device. 4,440,014, Cl. 73-35.000.

Hattori, Yoshinori: *See*—
Shimamori, Toru; Hattori, Yoshinori; and Matsuo, Yasushi, 4,440,707, Cl. 264-65.000.

Hauguth, Hubert, to Fichtel & Sachs AG. Flywheel clutch assembly. 4,440,281, Cl. 192-48.800.

Hauni-Werke Korber & Co. KG.: *See*—
Oppelt, Peter; Uhlig, Uwe; Redeker, Werner; and Peschik, Werner, 4,439,951, Cl. 51-80.00R.

Hauschild, John P.; and Principe, Joseph R., to Colgate-Palmolive Company. Functional agglomerated speckles and methods for manufacturing such speckles. 4,440,877, Cl. 523-105.000.

Havas, Jeno: *See*—
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; Muller, Henrik; Nyiro, Katalin; and Takacs, Ferenc, 4,440,619, Cl. 204-401.000.

Hawkins, Richard E., to Champlain Cable Corporation. Coaxial cables. 4,440,973, Cl. 174-107.000.

Haworth, Inc.: *See*—
Wisniewski, Joseph M., 4,440,372, Cl. 248-406.000.

Hayakawa, Yoshihiro; Yano, Tsutomu; Tachita, Ryobun; Fukukita, Hiroshi; Irioka, Kazuyoshi; and Fukumoto, Akira, to Matsushita Electric Industrial Company, Limited. Arc scan transducer array having a diverging lens. 4,440,025, Cl. 73-642.000.

Hayase, Tokuji: *See*—
Ishikawa, Toshikatsu; Tanaka, Junichi; Teranishi, Haruo; Okamura, Tatsuya; and Hayase, Tokuji, 4,440,571, Cl. 75-229.000.

Hayashibe, Shuji, to Toyo Systems, Ltd. Apparatus for tuning PID controllers in process control systems. 4,441,151, Cl. 364-157.000.

Hayes Microcomputer Products, Inc.: *See*—
Heatherington, Dale A., 4,440,988, Cl. 179-2.00C.

Hayn, John W.: *See*—
McDonough, Kevin C.; Hayn, John W.; Bellay, Jeffrey D.; and Thaden, Robert C., 4,441,154, Cl. 364-200.000.

Haynes, Ronald L.: *See*—
Crano, John C.; and Haynes, Ronald L., 4,440,909, Cl. 525-277.000.

Hazue, Masaaki: *See*—
Azuma, Makoto; and Hazue, Masaaki, 4,440,739, Cl. 424-1.100.

Heatherington, Dale A., to Hayes Microcomputer Products, Inc. Modem with low part count and improved demodulator. 4,440,988, Cl. 179-2.00C.

Heebner, Richard W.; and Schmitt, Randal L., to Western Electric Company, Inc. Technique for inspecting semiconductor wafers for particulate contamination. 4,441,124, Cl. 358-106.000.

Heep, Jerry J.; and Schreiber, Paul, to Tady Corporation. Computer and peripheral interface circuit. 4,440,987, Cl. 179-2.0DP.

Heidelberger Druckmaschinen: *See*—
Beisel, Hermann, 4,440,081, Cl. 101-148.000.

Heins, Ferdinand; Matner, Martin; and Striegler, Hellmut, to Bayer Aktiengeselischaft. Synthetic rubber dispersions containing carboxyl groups, a process for their preparation and their use. 4,440,895, Cl. 524-822.000.

Heinz, Manigel; and Hermann, Stroter, to Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co. Method of producing twice the number of single or ribbon conductors in a processing machine and apparatus therefor. 4,439,906, Cl. 29-412.000.

Helena Laboratories Corporation: *See*—
Tabb, David L.; and Burrows, Janine P., 4,440,724, Cl. 422-56.000.

Helfand, David; and Sellers, Ralph F., to Ciba-Geigy Corporation. Solid epoxy resin systems. 4,440,914, Cl. 525-482.000.

Helfman, Robert. Residential building construction. 4,439,959, Cl. 52-90.000.

Heller, Werner H., to UMC Industries, Inc. Two stage speed reducer. 4,440,044, Cl. 74-804.000.

Helmus, Martin C.; and Baker, Wallace L. Air-filtration module with ionization for elimination of static electricity. 4,440,553, Cl. 55-126.000.

Henderson, Alva E.; and Wiggins, Richard H., to Texas Instruments Incorporated. Speech synthesis system utilizing variable frame rate. 4,441,201, Cl. 381-51.000.

Henderson, James W.: *See*—
Coleman, Guy B.; Henderson, James W.; and Sacks, Jacob M., 4,441,165, Cl. 364-900.000.

Henke, Steven J.: *See*—
Holtzberg, Matthew W.; Henke, Steven J.; Spaulding, Lawrence D.; and Oakley, James C., 4,440,069, Cl. 92-224.000.

Henley-Cohn, Julian L.; and Jakubczak, Eugene R., to Wright Manufacturing Company. Apparatus to assist esophageal speech. 4,439,872, Cl. 3-1.300.

Henning, Klaus-Dirk; Klein, Jurgen; and Harder, Burkhard, to Bergwerksverband GmbH. Method for the adsorptive removal of hydrogen sulfide from gas mixtures. 4,440,551, Cl. 55-73.000.

Hennion, Claude: *See*—
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Henry, Joseph D. Dispenser for nuts or the like. 4,440,322, Cl. 222-153.000.

Hensche, Karl-Heinz: *See*—
Steinecke, Rudolf; and Hensche, Karl-Heinz, 4,440,252, Cl. 180-89.150.

Henslee, Samuel P.; Noronha, Pascal J.; and Logan, John B., to General Dynamics Corporation. Method and means for operating a drill for eliminating axial scratches during retraction. 4,440,529, Cl. 408-1.00R.

Hensler, Thomas A.: *See*—
Wells, Edward R.; and Hensler, Thomas A., 4,440,597, Cl. 162-111.000.

Herd, Richard S.: *See*—
Piotrowski, Alfred B.; and Herd, Richard S., 4,440,658, Cl. 252-51.50A.

Hergenrother, William L.; and Doshak, John M., to Firestone Tire & Rubber Company, The. Polyethylene terephthalate molding compositions. 4,440,889, Cl. 524-143.000.

Hermann, Stroter: *See*—
Heinz, Manigel; and Hermann, Stroter, 4,439,906, Cl. 29-412.000.

Herrmann, Gerhard: *See*—
Olschewski, Armin; Herrmann, Gerhard; and Bauer, Bernhard, 4,440,401, Cl. 277-50.000.

Herve, Jean-Jacques; Suglia, Jean-Claude; and Meinard, Colette, to Roussel Uclaf. Light-stable pesticidal compositions. 4,440,756, Cl. 424-174.000.

Hess, Walter: *See*—
Gotting, Otto; Hess, Walter; and Nicolai, Franz, 4,440,533, Cl. 409-299.000.

Hess, Walter R. Vehicle hub step. 4,440,411, Cl. 280-165.000.

Hesston Corporation: *See*—
Gaeddert, Melvin V., 4,440,075, Cl. 100-5.000.

Hettinger, William P., Jr.; Beck, Hubert W.; and Kovach, Stephan M., to Ashland Oil, Inc. Carbo-metallic oil conversion catalysts. 4,440,868, Cl. 502-65.000.

Hewson, Clifford B.: *See*—
Stewart, John M.; and Hewson, Clifford B., 4,439,875, Cl. 4-321.000.

Heyn, William M., to Continental Group, Inc., The. Closure for domed beverage containers and the like. 4,440,310, Cl. 220-270.000.

Hi-Speed Checkweigher Co., Inc.: *See*—
Del Rosso, Victor, 4,440,249, Cl. 177-145.000.

Hicks, Alan A.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Toy puzzle. 4,440,394, Cl. 273-157.00R.

Hicks, Mervyn L., to Turn-Styles Limited. Fluid flow sensor and control devices and apparatus. 4,440,110, Cl. 119-14.080.

Hidaka, Takayoshi: *See*—
Katsumi, Ikuo; Kondo, Hideo; Yamashita, Katsuji; Hidaka, Takayoshi; Hosoe, Kazunori; Ariki, Yutaka; Yamashita, Toshiaki; and Watanabe, Kiyoshi, 4,440,784, Cl. 424-308.000.

Higashiwaki, Michio: *See*—
Takeda, Tsuneshi; Otsuji, Kazuya; Tamura, Junichi; Morii, Yoshikazu; Higashiwaki, Michio; and Nakatani, Yoshitaka, 4,440,732, Cl. 423-415.00P.

Higratherm Electric GmbH: *See*—
Dahlberg, Reinhard, 4,441,115, Cl. 357-38.000.

Hikizi, Seizi: *See*—
Uchiya, Tsuneo; Yabuta, Hiroaki; and Hikizi, Seizi, 4,440,552, Cl. 55-114.000.

Hilbertz, Wolf H., to Marine Resources Company, The. Repair of reinforced concrete structures by mineral accretion. 4,440,605, Cl. 204-16.000.

Hill, Joel D., to Calgon Carbon Corporation. Pressure swing absorption system. 4,440,548, Cl. 55-26.000.

Hill, John B.: *See*—
Dryden, Hugh L.; and Hill, John B., 4,440,677, Cl. 260-112.50R.

Hilldale Enterprises: *See*—
Campbell, Robert G.; and Campbell, Warren A., III, 4,440,321, Cl. 222-153.000.

Hillenbrand, Gary F.: *See*—
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,440,846, Cl. 430-138.000.

Hillinger, George, to Alltrade, Inc. Wedge and axe head. 4,440,205, Cl. 145-2.00R.

Hillstead, David P.: *See*—
Behle, Gunter R.; and Hillstead, David P., 4,440,379, Cl. 251-144.000.

Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, to Sandoz Ltd. 4-Aminomethylpolyalkylpiperidines useful as light stabilizers. 4,440,887, Cl. 524-99.000.

Hinz, Ronald W.: *See*—
Davidson, James P.; Rosenberg, Barnett; and Hinz, Ronald W., 4,440,782, Cl. 424-287.000.

Hinze, Adrien G.: *See*—
van Rijs, Gerrit A.; Kardol, Arie D.; and Hinze, Adrien G., 4,440,660, Cl. 252-56.00S.

Hioki, Shunichi: *See*—
Tsuzuki, Akira; Kibe, Takeo; and Hioki, Shunichi, 4,440,662, Cl. 252-106.000.

Hirabe, Kenji: *See*—
Takeshige, Kenji; Hirabe, Kenji; Ogawa, Yukifumi; Arikata, Kazuyoshi; Yako, Kazunori; Sakai, Kenichi; Matsuo, Toshinori; and Kamio, Hiroshi, 4,440,584, Cl. 148-128.000.

Hiraga, Ryozo, to Canon Kabushiki Kaisha. Printing apparatus. 4,440,493, Cl. 355-86.000.

Hirai, Koichi: *See*—
Miyazaki, Haruhiko; Uda, Taizo; Hirai, Koichi; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,440,873, Cl. 502-244.000.

Hirai, Syoichi: *See*—
Kobayashi, Tetuo; and Hirai, Syoichi, 4,440,354, Cl. 242-54.00R.

Hirata, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Power converting device and a protection device for the same. 4,441,148, Cl. 363-54.000.

Hirokawa, Tadahiko: *See*—
Ohki, Katsumoto; Hirokawa, Tadahiko; and Sasaki, Hajime, 4,440,701, Cl. 264-15.000.

Hirosawa, Kuninori: *See*—
Akiyama, Hiroyuki; Hirosawa, Kuninori; and Kuwabara, Hideki, 4,440,703, Cl. 264-50.000.

Hirose, Akira: *See*—
Ikoma, Tadashi; Hirose, Akira; and Kakitani, Yohtaro, 4,440,387, Cl. 271-245.000.

Hirose, Fumio: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,440,757, Cl. 424-180.000.

Hirose, Takao: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,440,624, Cl. 208-22.000.

Hirozawa, Stanley T.: *See*—
Wilson, Joe C.; Hirozawa, Stanley T.; and Conville, John J., 4,440,721, Cl. 422-16.000.

Hirsimaki, Olavi: *See*—
Karras, Matti R.; and Hirsimaki, Olavi, 4,440,507, Cl. 374-39.000.

Hirtsiefer, Karl-Richard; Muller, Johann; Walterscheid, Kurt; and Wagner, Paul-Heinz, to Wagner, Paul-Heinz. Power wrench. 4,440,046, Cl. 81-57.390.

Hitachi Cable Ltd.: *See*—
Nishida, Shigeo; Miyagi, Mitsunobu; and Mikoshiba, Koichi, 4,441,091, Cl. 333-242.000.

Hitachi Chemical Co., Ltd.: *See*—
Yamamoto, Takanobu; Sumida, Isao; Tsukamoto, Moriaki; Imani, Kazutake; and Watahiki, Naohisa, 4,440,151, Cl. 126-433.000.

Hitachi, Ltd.: *See*—
Kakehi, Yutaka; Terada, Katsuyuki; Kasai, Kenjiro; and Iwasaki, Fumio, 4,440,093, Cl. 105-164.000.
Kita, Yasuhiro; Tsukamoto, Nobuo; Koya, Masahiro; and Maeda, Narimichi, 4,441,192, Cl. 375-14.000.
Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Hosaka, Sumio; Kawamura, Yoshio; and Terasawa, Tsuneo, 4,441,206, Cl. 382-08.000.
Matsuura, Tsuguo; Torii, Shunichi; and Shimizu, Tsuguo, 4,441,152, Cl. 364-200.000.
Mori, Akio; Watanabe, Shozo; Matsunaga, Mitsunobu; Machizawa, Kenzi; and Minowa, Ryohei, 4,439,999, Cl. 62-238.300.
Ogawa, Tsuneo; Ikeda, Manabu; Miyakawa, Seii; Iijima, Kazunori; Terayama, Takao; and Matsui, Takeshi, 4,441,133, Cl. 360-130.220.
Sakurai, Takeichi; Goto, Kiyoshi; Konishi, Hiroo; and Kawai, Tadao, 4,441,032, Cl. 307-82.000.
Sato, Takao; Ito, Tetsuo; and Arita, Setsuo, 4,440,715, Cl. 376-210.000.
Tamai, Yasumasa; and Koyama, Takaichi, 4,440,339, Cl. 228-119.000.
Yamamoto, Takanobu; Sumida, Isao; Tsukamoto, Moriaki; Imani, Kazutake; and Watahiki, Naohisa, 4,440,151, Cl. 126-433.000.

Hitachi Metals, Ltd.: *See*—
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Hitachi Plant Engineering & Construction Co., Ltd.: *See*—
Uchiya, Tsuneo; Yabuta, Hiroaki; and Hikizi, Seizi, 4,440,552, Cl. 55-114.000.

Hitachi Shipbuilding & Engineering Company Limited: *See*—
Ono, Kuniaki, 4,440,211, Cl. 164-442.000.

Hitaka, Yosatomi; and Namiki, Takemasa, to Konishiroku Photo Industry Co., Ltd. Method for coating and an apparatus for coating. 4,440,811, Cl. 427-402.000.

Hobbs, Charles F., to Monsanto Company. Catalyst and reverse disproportionation process. 4,440,967, Cl. 585-435.000.

Hobbs, Charles F., to Monsanto Company. Catalyst and reverse disproportionation process. 4,440,968, Cl. 585-435.000.

Hoberstorfer, Gustav; and Nores, Torsten. Method for opening mineral deposit and subsequent mining thereof. 4,440,448, Cl. 299-11.000.

Hochmair, Erwin S.; and Hochmair, Ingeborg J. Transcutaneous signal transmission system and methods. 4,441,210, Cl. 455-41.000.

Hochmair, Ingeborg J.: *See*—
Hochmair, Erwin S.; and Hochmair, Ingeborg J., 4,441,210, Cl. 455-41.000.

Hoda, Takeo; Oyokota, Shigeru; Seigenji, Kiyoshi; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Photographic camera. 4,440,481, Cl. 354-171.000.

Hodges, Michael J., to Dextomat Machinery Limited. Apparatus for unloading hosiery machinery. 4,440,329, Cl. 223-43.000.

Hoechst Aktiengesellschaft: *See*—
Diery, Helmut; and Mees, Bernhard, 4,440,902, Cl. 525-404.000.
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,440,570, Cl. 75-121.000.
Oborodnik, Alexander; Keuper, Hans W.; Semmler, Horst; Hardel, Joachim; Vierling, Hermann; and Willms, Robert, 4,440,925, Cl. 528-487.000.
von der Eltz, Hans-Ulrich; and Oppitz, Peter, 4,439,881, Cl. 8-151.000.
Willms, Lothar; Mildenberger, Hilmar; Gunther, Dieter; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,440,565, Cl. 71-93.000.

Hoerauf, Werner: *See*—
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Hoerner, Harry J.: *See*—
McCrery, David N., Jr.; Hoerner, Harry J.; and Purlee, John W., 4,440,078, Cl. 101-4.000.

Hoff, Joseph T.: *See*—
Goldstein, Henry; Hoff, Joseph T.; Cronan, Charles L.; and Rao, Ch. S., 4,440,795, Cl. 426-592.000.

Hoffman, James S., to General Motors Corporation. Isostatic molding of two-terminal ceramic insulator. 4,440,706, Cl. 264-56.000.

Hoffman, Louis S.; and Kurlander, Susan L., to H. P. Hood Inc. Sealed moistureproof container. 4,440,311, Cl. 220-306.000.

Hoffmann, Horst, to Wilhelm Ruf KG. Printed board for electrical circuits. 4,440,823, Cl. 428-209.000.

Hoffmann, Kurt, to Siemens Aktiengesellschaft. Monolithically integrated semiconductor memory. 4,441,171, Cl. 365-205.000.

Hoffmann-La Roche Inc.: *See*—
Walser, Armin; and Fryer, Rodney I., 4,440,685, Cl. 260-245.600.

Hoffmann, Wolfgang: *See*—
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Hofmeister, Helmut: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; and Wiechert, Rudolf, 4,440,684, Cl. 260-239.570.

Hohne, Gerhard: *See*—
Honolke, Friedrich; Brandl, Adrian; Schibilla, Eduard; and Hohne, Gerhard, 4,440,544, Cl. 44-51.000.

Holdeman, John W., to Borg-Warner Corporation. Helical planetary gear assembly. 4,440,042, Cl. 74-785.000.

Hollmann, Friedrich: *See*—
Feldmann, Hugo; Hollmann, Friedrich; Beisemann, Gerd; and Gartner, Horst, 4,440,012, Cl. 72-201.000.

Holm, Harold K. Sander for artificial nails. 4,440,182, Cl. 132-75.600.

Holm, Kurt A., to Bycasin AB. Device for cleaning objects by scrubbing in the presence of solvent. 4,439,882, Cl. 15-77.000.

Holmes, Billy G., to Mobil Oil Corporation. Well completion for injecting high purity oxygen in a fire flooding process. 4,440,227, Cl. 166-261.000.

Holmes, Russell C.: *See*—
Foxton, Robert J.; Kappheim, David A.; and Holmes, Russell C., 4,440,037, Cl. 74-331.000.

Holstein & Kappert GmbH: *See*—
Knabe, Uwe, 4,440,201, Cl. 141-286.000.

Holtrop, John W., to United States of America, Navy. Launch mechanism. 4,440,365, Cl. 244-137.00R.

Holtzberg, Matthew W.; Henke, Steven J.; Spaulding, Lawrence D.; and Oakley, James C., to Standard Oil Corporation (Indiana). Composite piston and process. 4,440,069, Cl. 92-224.000.

Holzel, Thomas M. Closed-circuit breathing apparatus. 4,440,165, Cl. 128-205.280.

Holzwarth, George M., to Exxon Research and Engineering Co. Oil recovery using modified heteropolysaccharides in buffered brine. 4,440,225, Cl. 166-246.000.

Homestake Mining Company: *See*—
Mudder, Terrence I.; and Whitlock, James L., 4,440,644, Cl. 210-611.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kamiya, Tadashi, 4,440,412, Cl. 280-281.00B.
Kurihara, Norimitsu; Kinoshita, Katsuharu; Watanabe, Masao; Sato, Toyohiro; and Kawazoe, Takashi, 4,440,033, Cl. 74-7.00A.
Miyakoshi, Shinichi; and Yamamoto, Kazuhiro, 4,440,413, Cl. 280-284.000.
Shinozaki, Takashi, 4,440,255, Cl. 180-225.000.
Yagasaki, Akio; and Watanabe, Masaki, 4,439,886, Cl. 15-250.200.

Honeywell, Inc.: *See*—
Gerchman, Robert D.; Newport, Ronald L.; and van Dyke, Martin J., 4,441,157, Cl. 364-551.000.
Kitchen, Robert D., 4,440,368, Cl. 248-27.100.
Rahman, Mona A., 4,441,072, Cl. 323-368.000.

Honeywell Information Systems Inc.: *See*—
Baldwin, David R.; and Lemak, Nicholas S., 4,441,195, Cl. 377-2.000.

Hong, Rong-Fu. Electric soldering iron temperature adjustable by changing handle position during use. 4,441,014, Cl. 219-240.000.

Honolke, Friedrich; Brandl, Adrian; Schibilla, Eduard; and Hohne, Gerhard, to Uhde GmbH. Process for the conversion of ground hydrous lignite into a pumpable dehydrated suspension of fine-ground lignite and oil. 4,440,544, Cl. 44-51.000.

Hontz, Thomas D.: *See*—
Koncelik, Joseph A.; Chaney, David B.; Lockard, Walter G.; and Hontz, Thomas D., 4,439,880, Cl. 5-429.000.

Hooker, Donald E.; and Tojza, Roman A., to Bally Manufacturing Corporation. Gaming apparatus having manually controllable operating speed. 4,440,036, Cl. 74-153.000.

Hoopengardner, Merle C.; and Wenzel, William B., to Orcon Corporation. Carpet seaming roller tool. 4,439,904, Cl. 29-110.500.

Hooper, Clinton E., to Pitney Bowes Inc. Disposable inking cartridge. 4,440,083, Cl. 101-348.000.

Horan, Ann C.: *See*—
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Hordon, Monroe J.; and Gerace, Robert E., to Xerox Corporation. Process for preparing arsenic-selenium photoreceptors. 4,440,803, Cl. 427-74.000.
Horike, Masaki: *See*—
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Horiuchi, Tatsuo; and Kiyota, Kazushige, to Ushio Denki Kabushiki Kaisha. Auxiliary head lamp device for car equipped with cover. 4,441,144, Cl. 362-375.000.
Horodysky, Andrew G., to Mobil Oil Corporation. Borated alkoxylated alcohols and lubricants and liquid fuels containing same. 4,440,656, Cl. 252-49.600.
Horodysky, Andrew G.: *See*—
Gemmill, Robert M., Jr.; and Horodysky, Andrew G., 4,440,655, Cl. 252-47.500.
Horowitz, Harold S.; and Lewandowski, Joseph T., to Exxon Research and Engineering Co. Method of synthesizing high surface area unagglomerated noble metal pyrochlore compounds. 4,440,670, Cl. 252-518.000.
Horvay, Julius B.; and Prada, Luis E., to General Electric Company. Apparatus and method of controlling air temperature of a two-evaporator refrigeration system. 4,439,998, Cl. 62-199.000.
Horwath, Robert O.; and Colonna, William J., to Nabisco Brands, Inc. Process for preparing L-glucosone. 4,440,855, Cl. 435-105.000.
Hosaka, Sumio: *See*—
Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Hosaka, Sumio; Kawamura, Yoshio; and Terasawa, Tsuneo, 4,441,206, Cl. 382-08.000.
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Hosoe, Kazunori: *See*—
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Hotchkiss-Brandt Sogeme H.B.S.: *See*—
Divoux, Michel; and Dorez, Michel, 4,440,388, Cl. 271-195.000.
Houle, Raymond T., to Silchor. Shower arrangement for bathing units. 4,439,877, Cl. 4-596.000.
House, David C., to Prawl Engineering Corporation. Press lock fascia-cant system. 4,439,956, Cl. 52-60.000.
Houseman, Kenneth R., to General Dental Inc. Metal collector. 4,440,616, Cl. 204-272.000.
Houseman, Robin D., to Beckman Instruments, Inc. Temperature compensation circuit for thermocouples. 4,441,071, Cl. 323-365.000.
Houseworth, Burt B.: *See*—
Downing, Harry M., 4,440,783, Cl. 424-302.000.
Howard, Anthony, to Xerox Corporation. Variable force wide document belt transport system. 4,440,492, Cl. 355-76.000.
Howard, Robert W., to General Electric Company. Steam driven water injection. 4,440,719, Cl. 376-372.000.
Howe, Philip M.; Gibbons, Gould; Aseltine, Clifford L.; and Williams, Frank, to United States of America, Army. Anti-propagation explosive packaging. 4,440,296, Cl. 206-3.000.
Howeth, D. Franklin. Drill cuttings conveying head with wet cuttings diverter. 4,440,243, Cl. 175-209.000.
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Hryck, Michael D.: *See*—
Dayger, Douglas A.; Hryck, Michael D.; Skinner, Dean W.; and Westcott, Gerald R., 4,440,079, Cl. 101-93.030.
Huang, Emil A., to Nabisco Brands, Inc. Low cost texturized vegetable protein. 4,440,798, Cl. 426-656.000.
Huang, Fu-chih, to USV Pharmaceutical Corporation. Bicycloimidazoles. 4,440,935, Cl. 548-326.000.
Hudziak, Lawrence C.; and Hartlaub, Jerome T., to Medtronic. Programmable body stimulation system. 4,440,173, Cl. 128-419.0PG.
Hughes Aircraft Company: *See*—
Coleman, Guy B.; Henderson, James W.; and Sacks, Jacob M., 4,441,165, Cl. 364-900.000.
Rosser, Robin W.; and Keller, Leon B., 4,440,819, Cl. 428-107.000.
Vasudev, Prahalad K., 4,439,910, Cl. 29-569.00L.
Hughes Tool Company: *See*—
Baugh, John L.; and Hardy, Melvin J., 4,440,233, Cl. 166-382.000.
Hujik, Ladislav. Mold for footwear sole. 4,440,377, Cl. 249-119.000.
Hunt, Gary A.: *See*—
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Hunt, Harlley L.; and Fletcher, Ansel T., to Ingersoll-Rand Company. Delayed deployment platform. 4,440,262, Cl. 182-114.000.
Hunter, Gray H., to Egolf, Daniel Lee, a part interest. Sound responsive lighting device with VCO driven indexing. 4,440,059, Cl. 84-464.00R.
Hunter, Walter D., to Texaco Development Corporation. Process for secondary recovery. 4,440,652, Cl. 252-8.55D.
Hupp, Gerhard, to Mauser-Werke Oberndorf GmbH. Breech mechanism for automatic firearms. 4,440,065, Cl. 89-191.00R.
Hursey, Robert: *See*—
Ryan, Dennis M.; and Hursey, Robert, 4,440,358, Cl. 242-189.000.
Hutchins, Ned M., to Occidental Oil Shale, Inc. Fluid outlet at the bottom of an in situ oil shale retort. 4,440,445, Cl. 299-2.000.
Hutchins, Ned M., to Occidental Oil Shale, Inc. Method for forming a module of in situ oil shale retorts. 4,440,446, Cl. 299-2.000.
Huth, Wolfgang: *See*—
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Huxtable, Peter J. Clip for securing around a member such as a pipe. 4,439,902, Cl. 24-278.000.
Hybrid Energy Systems, Inc.: *See*—
Briley, Patrick B., 4,439,994, Cl. 62-101.000.
Hyche, Kenneth W.: *See*—
Cook, Mary J.; and Hyche, Kenneth W., 4,440,888, Cl. 524-139.000.
Hydo, Steven J.: *See*—
Carey, Glen A.; and Hydo, Steven J., 4,440,497, Cl. 356-246.000.
Hyland, Joseph F.; Wetherell, Joseph J.; and Setteducati, Mark. Variable geometric board game. 4,440,395, Cl. 273-241.000.
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Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Open top refrigerated case with defrost air intake and colliding band air defrost. 4,439,992, Cl. 62-82.000.
ICI Americas inc.: *See*—
Shapiro, Howard S., 4,440,768, Cl. 424-248.400.
Ihara, Keisuke; Hoshino, Shozi; and Tanioka, Susumu, to Tokyo Denki Kabushiki Kaisha. Juice extractor. 4,440,074, Cl. 99-510.000.
Ihlenfeld, Jay V.: *See*—
Rice, David E.; and Ihlenfeld, Jay V., 4,440,918, Cl. 526-246.000.
Ihrman, Kryn G., to Ethyl Corporation. 1-Methyl-2,6-diamino-3-isopropyl benzene. 4,440,952, Cl. 564-305.000.
Iida, Kazuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Picture information processing and storing device. 4,441,208, Cl. 382-56.000.
Iijima, Kazunori: *See*—
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Ikeda, Takeshi; Yamamoto, Atsuko; and Kasai, Masanao, to Canon Kabushiki Kaisha. Process for production of photoconductive cadmium sulfide. 4,440,735, Cl. 423-561.00B.
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Ikegami, Hiroshi; Nagira, Norichika; and Yui, Katsuhiko, to Nippon Steel Corporation. Method of controlled cooling for steel strip. 4,440,583, Cl. 148-128.000.
Ikezawa, Harumi: *See*—
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Ikezawa, Kenji; Takao, Hiroshi; Ambe, Satoshi; and Uchida, Masaaki, to Nissan Motor Co., Ltd. Method of making an oxygen sensor. 4,439,911, Cl. 29-570.000.
Ikoma, Tadashi; Hirose, Akira; and Kakitani, Yohtaro, to Ricoh Company, Ltd. Sheet feed apparatus. 4,440,387, Cl. 271-245.000.
Ikuzawa, Masanori: *See*—
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Imgram, Friedrich. Process for the preparation of shaped articles. 4,440,712, Cl. 264-209.500.
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Inami, Sumio: *See*—
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Indian Head Inc.: *See*—
Pate, Harold T.; and Fochler, Helmut P., 4,440,425, Cl. 285-161.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Pavan, Gianni; and Lorenzi, Mario, 4,441,164, Cl. 364-900.000.
Ingersoll-Rand Co.: *See*—
Casperovich, John J., 4,440,237, Cl. 173-134.000.
Hunt, Harlley L.; and Fletcher, Ansel T., 4,440,262, Cl. 182-114.000.
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Jacquin, Yves; Gimenez-Coronado, Manuel; and Dai-Nghia, Huynh, 4,440,633, Cl. 208-309.000.
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Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.
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Jenkins, Michael O., 4,441,081, Cl. 330-110.000.
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Adams, Gary E., 4,440,013, Cl. 73-23.100.
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Brownlow, James M.; and Chang, Ifay F., 4,440,831, Cl. 128-404.000.
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Kabelac, William J.; and Sanders, Ian L., 4,441,166, Cl. 365-36.000.
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Nassimbene, Ernie G., 4,440,515, Cl. 400-479.000.
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Hart, Peter A., 4,441,159, Cl. 364-771.000.
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Boden, Richard M., 4,440,961, Cl. 568-840.000.
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Nath, Dilip K.; Pureza, Pablo C.; and Oh, Shin M., 4,440,558, Cl. 65-3.120.
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Internil, Inc.: *See*—
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Iten, Thomas, 4,441,034, Cl. 307-117.000.
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Potter, John T., 4,440,038, Cl. 74-424.80R.
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Irving, Edward, to Ciba-Geigy Corporation. Preparation of prepregs from cellulosic fibers using water-borne resin compositions. 4,440,802, Cl. 427-54.100.
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Ishibashi, Junya; Miyazaki, Shigeru; and Tanaka, Shoichi, to Toshiba Kikai Kabushiki Kaisha. Multishaft supporting devices. 4,440,511, Cl. 384-278.000.
Ishibashi, Masanori, to Casio Computer Co., Ltd. Electronic musical instrument with improved input device. 4,440,057, Cl. 84-1.010.
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Dielenberg, Olif F., 4,439,967, Cl. 52-309.120.
Itek Corporation: *See*—
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Iten, Thomas, to Inventio AG. Contact-controlled capacitive switching apparatus. 4,441,034, Cl. 307-117.000.
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ITT Industries, Inc.: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, 4,440,454, Cl. 303-114.000.
Gahle, Hans-Juergen, 4,440,580, Cl. 148-1.500.
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Ivory, Dawn M.; Miller, Granville G.; Chance, Ronald R.; and Baughman, Ray H., to Allied Corporation. Electrically conducting compositions of doped polyphenylenes and shaped articles comprising the same. 4,440,669, Cl. 252-518.000.
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Schiel, Christian, 4,440,077, Cl. 100-162.00B.
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Jenkins, Rand G.; and Wohlers, Norman W., 4,440,550, Cl. 55-67.000.
Jackson, Prentiss W., to Northern Telecom Limited. Electrical display apparatus with reduced peak power consumption. 4,441,106, Cl. 340-811.000.
Jacobsen, Preben, to Jamo Hi-Fi A/S. Bass-reflex loudspeaker system. 4,440,260, Cl. 181-172.000.
Jacobson, Andrew G. Optical device for an intensifier tube. 4,440,476, Cl. 350-538.000.
Jacquin, Yves; Gimenez-Coronado, Manuel; and Dai-Nghia, Huynh, to Institut Francais du Petrole. Process for solvent deasphalting heavy hydrocarbon fractions. 4,440,633, Cl. 208-309.000.
Jakubczak, Eugene R.: *See*—
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James, William G., to General Electric Company. Incandescent lamps with neodymium oxide vitreous coatings. 4,441,046, Cl. 313-112.000.
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Jannusch, Leonard C., to H. B. Fuller Company. Caustic sensitive, water resistant labeling adhesive. 4,440,884, Cl. 524-26.000.
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Nomoto, Reishi; Takahashi, Masayoshi; and Ebata, Yoshikazu, 4,440,171, Cl. 128-335.500.
Japan Metals and Chemicals Co., Ltd.: *See*—
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Jasenof, Kenneth E.: *See*—
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Jautelat, Manfred; and Arlt, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of 2,2-dimethyl-3-vinyl-cyclopropanecarboxylic acids and esters. 4,440,955, Cl. 568-419.000.
Jeltema, Paul A., to Consolidated Papers, Inc. Paper coating apparatus having a replaceable orifice plate. 4,440,105, Cl. 118-410.000.
Jenkins, Michael O., to International Business Machines. Switching power driving circuit arrangement. 4,441,081, Cl. 330-110.000.
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Jenkins, Richard C., to Owens-Corning Fiberglas Corporation. Composite insulation panel. 4,439,960, Cl. 52-99.000.
Jentoft, Arthur P.; and Couture, Paul A., to Wasco Products, Inc. Skylight construction. 4,439,962, Cl. 52-200.000.
Jessup, Frank L.; and Kaiser, Robert S. Apparatus for delaying the closing of a door. 4,440,428, Cl. 292-251.500.
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Zychowski, Edwin A.; Jasenof, Kenneth E.; and Jimenez, Artemio L., 4,440,894, Cl. 524-390.000.
Joffe, Boris B.; Spongr, Jerry J.; and Sawyer, Byron E., to Twin City International Inc. Coating thickness measuring device. 4,441,022, Cl. 250-308.000.
John Wyeth & Brother Limited: *See*—
Crossley, Roger; and Dickinson, Kay H., 4,440,773, Cl. 424-263.000.
Johns Hopkins University, The: *See*—
Fischell, Robert E.; Fountain, Glen H.; and Blackburn, Charles M., 4,440,160, Cl. 128-132.00R.
Johnson, David D.: *See*—
Biller, Cleveland J.; and Johnson, David D., 4,440,305, Cl. 212-90.000.
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Marcellis, Alphonso W.; and Johnson, Grannis S., 4,440,577, Cl. 106-90.000.
Johnson, Van W. Fishing rod casting device for a disabled person. 4,439,944, Cl. 43-19.000.
Johnson, Warren E.; and Maliszewski, Andrzej, to Sherwood Tool, Incorporated. Receptacle forming apparatus having split receiver. 4,440,290, Cl. 198-479.000.
Jones, David E.: *See*—
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Jones, Faber B.: *See*—
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Jonsson, Gunther, to Lumalampan Aktiebolag. Procedure for chemical, automatic dissolution of molybdenum core wire in tungsten filament coil and a device for implementing the procedure. 4,440,729, Cl. 423-55.000.
Jordan, Ernst G., to OBO Bettermann OHG, Firma. Electrical stud-welding apparatus. 4,441,007, Cl. 219-98.000.
Joseph, Eric D.: *See*—
Davies, Robert B.; and Joseph, Eric D., 4,441,070, Cl. 323-268.000.
Jourde, Jean-Pierre, to Regie Nationale des Usines Renault. Device for premetered pressure-time injection. 4,440,133, Cl. 123-446.000.
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Judy, Millard M.; and Sutko, John L., to U.T. Board of Regents. Surface field-effect device for manipulation of charged species. 4,440,638, Cl. 210-198.200.
Jungmeister, Hans G., to Siemens Aktiengesellschaft. Monitoring method and device for a PCM regenerator having a code rule violation checking device. 4,441,185, Cl. 371-56.000.
Juntgen, Harald: *See*—
Gappa, Gunther; Degel, Josef; and Juntgen, Harald, 4,439,932, Cl. 34-57.00D.
Jurgens, Rainer, to Christensen, Inc. Cutting member for rotary drill bits. 4,440,246, Cl. 175-329.000.
Juy, Henry, to Etablisements le Simplex. Saddle rod for bicycles and like vehicles. 4,440,440, Cl. 297-195.000.
Kaanders, Johannes M. G. M.; van Rijsewijk, Cornelis H. M.; and Smerecnik, Antoon F., to U.S. Philips Corporation. Hearing aid. 4,440,982, Cl. 179-107.00R.
Kabas, Guglielmo: *See*—
Bellus, Daniel; Blaser, Hans-Ulrich; Kabas, Guglielmo; Reinehr, Dieter; Spencer, Alwyn; and Weber, Kurt, 4,440,694, Cl. 260-465.00D.
Kabelac, William J.; and Sanders, Ian L., to International Business Machines Corporation. Passive annihilator for contiguous-disk bubble devices. 4,441,166, Cl. 365-36.000.
Kabeshita, Akira: *See*—
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Kabushiki Kaisha Komatsu Seisakusho: *See*—
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Kaczerginski, Alexandre, to Ceraver. Electrical insulator including a molded one-piece cover having plate-like fins with arcuately displaced mold line segments. 4,440,975, Cl. 174-209.000.
Kaduk, Bruce A.: *See*—
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Kaehler, James A., to Atlantic Richfield Company, Inc. Heliostat control. 4,440,150, Cl. 126-425.000.
Kagerer, Franz, to Friedrich Deckel Aktiengesellschaft. Drive mechanism for a feed screw. 4,440,050, Cl. 82-21.00B.
Kai, Shinichiro: *See*—
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Kaiser Steel Corporation: *See*—
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Kajita, Shuji: *See*—
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Kakehi, Yutaka; Terada, Katsuyuki; Kasai, Kenjiro; and Iwasaki, Fumio, to Hitachi, Ltd. Vehicle tilt control apparatus. 4,440,093, Cl. 105-164.000.
Kaken Pharmaceutical Co., Ltd.: *See*—
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Kakitani, Yohtaro: *See*—
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Kalbacher, Hubert; and Voelter, Wolfgang. Substituted carbonic acid esters. 4,440,692, Cl. 260-463.000.
Kallay, Maria: *See*—
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Kamiya, Tadashi, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 4,440,412, Cl. 280-281.00B.
Kamiya, Takashi; Tanaka, Kunihiko; Nakai, Yoshiharu; and Sakane, Kazuo, to Fujisawa Pharmaceutical Co., Ltd. 3,7-Disubstituted-3-cephem-4-carboxylic acid compounds. 4,440,766, Cl. 424-246.000.
Kamiyama, Takashi: *See*—
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Kan, Fumitaka: *See*—
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Kanazawa, Tatsuo; and Suyama, Tsuneo, to Kubota, Ltd. Molding device for nested pipes. 4,440,300, Cl. 206-446.000.
Kanebo, Ltd.: *See*—
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Kanegafuchi Chemical Industry Company, Ltd.: *See*—
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Kanehira, Jun, to Olympus Optical Co., Ltd. Amorphous magnetic alloy. 4,440,585, Cl. 148-403.000.
Kanno, Fumio, to Citizen Watch Co., Ltd. Electronic timepiece. 4,440,502, Cl. 368-80.000.
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Sugiura, Shinji; Fujii, Yasuhiro; Sato, Katsunori; Nezu, Tuguo; and Okumura, Yasumasa, 4,440,913, Cl. 525-443.000.
Kanuma, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Arithmetic operation circuit. 4,441,158, Cl. 364-758.000.
Kao, David T., to University of Kentucky Research Foundation, The. Hydropower turbine system. 4,441,029, Cl. 290-52.000.
Kao Soap Co., Ltd.: *See*—
Takeda, Tsuneshi; Otsuji, Kazuya; Tamura, Junichi; Morii, Yoshikazu; Higashiwaki, Michio; and Nakatani, Yoshitaka, 4,440,732, Cl. 423-415.00P.
Kappel, Joseph; and Goldberg, Richard, to Coast Manufacturing Co., Inc. Adjustable camera strap construction. 4,440,334, Cl. 224-258.000.
Kappheim, David A.: *See*—
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Kardol, Arie D.: *See*—
van Rijs, Gerrit A.; Kardol, Arie D.; and Hinze, Adrien G., 4,440,660, Cl. 252-56.00S.

Karlow, James P.; and Hunt, Gary A., to General Motors Corporation. Audio system with orderly shutdown sequence. 4,441,086, Cl. 330-297.000.

Karlsson, Sven I. K., to SAB Automotive AB. Brake lever for an S-cam automotive drum brake. 4,440,268, Cl. 188-79.50K.

Karras, Matti R.; and Hirsimaki, Olavi, to Valmet Oy. Procedure for measuring thermal energy transported by fluid flow. 4,440,507, Cl. 374-39.000.

Karrasch, Frank: *See*—
Genatempo, Vince; and Karrasch, Frank, 4,440,207, Cl. 150-52.00R.

Karubian, Ralph. Stunning gun. 4,439,889, Cl. 17-1.00B.

Kasai, Kenjiro: *See*—
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Kasai, Masanao: *See*—
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Kashiwaba, Tadao: *See*—
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Katakura, Masayuki: *See*—
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Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, 4,441,084, Cl. 330-149.000.

Kataoka, Hiroyuki; and Arai, Yoshio, to Fuji Xerox Co., Ltd. Character shaping device. 4,440,513, Cl. 400-165.100.

Kato, Osamu: *See*—
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Katsumi, Ikuo; Kondo, Hideo; Yamashita, Katsuji; Hidaka, Takayoshi; Hosoe, Kazunori; Ariki, Yutaka; Yamashita, Toshiaki; and Watanabe, Kiyoshi, to Kanegafuchi Chemical Industry Company, Ltd. Anti-inflammatory, analgesic, and antipyretic pharmaceutical composition. 4,440,784, Cl. 424-308.000.

Katz, Jerome; and Fogel, Sidney J. Method and apparatus for high volume fractional distillation of liquids. 4,440,601, Cl. 203-24.000.

Kauff, Helmut: *See*—
Felger, Gunter; Glockler, Otto; Kauff, Helmut; Kiencke, Uwe; Knapp, Heinrich; and Stocker, Herbert, 4,440,131, Cl. 123-440.000.

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Balchjunas, Povilas I.; Martinaitis, Ionas J.; Tulaba, Sauljus A.; and Pilkauskas, Alfredas B., 4,441,055, Cl. 315-288.000.

Kavesh, Sheldon: *See*—
Kwon, Young D.; Kavesh, Sheldon; and Prevorsek, Dusan C., 4,440,711, Cl. 264-185.000.

Kawachi, Shoji; Yamamoto, Katsutoshi; and Kai, Shinichiro, to Daikin Kogyo Co., Ltd. Process for preparing filler-containing polytetrafluoroethylene fine powder. 4,440,879, Cl. 523-200.000.

Kawadoko, Shinichi: *See*—
Kinumoto, Namio; Nakao, Takashi; Murase, Hiroshi; Okada, Shigemitsu; and Kawadoko, Shinichi, 4,440,194, Cl. 138-89.000.

Kawagoe, Michio; and Tanaka, Masaaki, to Toyota Jidosha Kabushiki Kaisha. Diesel engine exhaust gas recirculation control system. 4,440,140, Cl. 123-571.000.

Kawahara, Haruyuki; Makita, Teruo; Kudo, Shozo; and Funakoshi, Takashi, to Kanebo, Ltd. Resin-forming material, implant material and compositions for restorative material suitable for medical or dental use. 4,440,878, Cl. 523-116.000.

Kawai, Tadao: *See*—
Sakurai, Takeichi; Goto, Kiyoshi; Konishi, Hiroo; and Kawai, Tadao, 4,441,032, Cl. 307-82.000.

Kawamata, Motoo: *See*—
Fujikake, Shiro; Kawamata, Motoo; and Tsuboi, Hikotada, 4,440,920, Cl. 528-128.000.

Kawamura, Yoshio: *See*—
Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Hosaka, Sumio; Kawamura, Yoshio; and Terasawa, Tsuneo, 4,441,206, Cl. 382-08.000.

Kawazoe, Takashi: *See*—
Kurihara, Norimitsu; Kinoshita, Katsuharu; Watanabe, Masao; Sato, Toyohiro; and Kawazoe, Takashi, 4,440,033, Cl. 74-7.00A.

Kayser-Roth Corporation: *See*—
Cordova, Robert A., 4,440,174, Cl. 128-455.000.

Kazaitis, Michael P., to Union Carbide Corporation. Synthetic food casing article employing a rigid hollow tubular core member with integral casing retention element. 4,439,890, Cl. 17-1.00R.

Kecskes, Lajos: *See*—
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; Muller, Henrik; Nyiro, Katalin; and Takacs, Ferenc, 4,440,619, Cl. 204-401.000.

Keeler, Arthur A.; Rice, William M.; and Tremayne, Edward C., to Commonwealth of Australia. Parachute control apparatus. 4,440,366, Cl. 244-138.00R.

Kehl, Joseph D.: *See*—
Groh, Allen R.; and Kehl, Joseph D., 4,441,177, Cl. 369-170.000.

Keiter, Alfred; Mudder, Wolfgang; and Tappehorn, Bernd, to Olympia Werke AG. Adjustable ribbon feed rates dependent upon ribbon type for ink ribbon cassettes. 4,440,514, Cl. 400-208.000.

Keller, Leon B.: *See*—
Rosser, Robin W.; and Keller, Leon B., 4,440,819, Cl. 428-107.000.

Keller, Michael I. Non-impact dot matrix printer. 4,441,112, Cl. 346-163.000.

Kelley, Albert W. Integral plant container and cover. 4,439,950, Cl. 47-85.000.

Kelly, Celeste. Convertible high style footwear. 4,439,935, Cl. 36-101.000.

Kelsey Hayes Company: *See*—
El-Sheikh, Kamal, 4,440,267, Cl. 188-73.350.

Kennecott Corporation: *See*—
Richmond, Wesley Q., 4,439,895, Cl. 23-305.00A.

Keogh, Michael J., to Union Carbide Corporation. Process of producing a water-curable, silane modified alkylene-alkyl acrylate copolymer by reacting an alkylene-alkyl acrylate copolymer with a polysiloxane predispersed in a thermoplastic resin matrix. 4,440,907, Cl. 525-106.000.

Kernforschungsanlage Julich GmbH: *See*—
Forster, Siegfried; Schindler, Stefan R.; and Pohlmann, Hans-Jurgen, 4,440,113, Cl. 122-16.000.

Kett, Brian L.: *See*—
Bockett-Pugh, Charles P.; and Kett, Brian L., 4,441,074, Cl. 324-73.00R.

Keuper, Hans W.: *See*—
Ohorodnik, Alexander; Keuper, Hans W.; Semmler, Horst; Hardel, Joachim; Vierling, Hermann; and Willms, Robert, 4,440,925, Cl. 528-487.000.

Keystone Consolidated Industries, Inc.: *See*—
Hallgren, Charles G., 4,440,459, Cl. 312-238.000.

Khoe, Giok D., to U.S. Philips Corporation. Optical transmission system coupling a semiconductor laser diode to a multimode optical fiber. 4,440,470, Cl. 350-96.200.

Kibe, Takeo: *See*—
Tsuzuki, Akira; Kibe, Takeo; and Hioki, Shunichi, 4,440,662, Cl. 252-106.000.

Kidde Recreation Products, Inc.: *See*—
Simonds, Gary, 4,440,142, Cl. 124-23.00R.

Kiedel, Paul: *See*—
Handrick, Kurt; Kolling, Georg; and Kiedel, Paul, 4,440,957, Cl. 585-323.000.

Kiekert GmbH & Co. Kommanditgesellschaft: *See*—
Kleefeldt, Frank, 4,440,006, Cl. 70-264.000.

Kiencke, Uwe: *See*—
Felger, Gunter; Glockler, Otto; Kauff, Helmut; Kiencke, Uwe; Knapp, Heinrich; and Stocker, Herbert, 4,440,131, Cl. 123-440.000.

Kifor, Harry T., to Goodyear Tire & Rubber Company, The. Apparatus for attaching fasteners to belts. 4,440,336, Cl. 227-4.000.

Killgo, Ronald W.: *See*—
Ehrman, Charles R.; Killgo, Ronald W.; and Piper, Paul P., Jr., 4,440,302, Cl. 206-506.000.

Kim, Chang J.: *See*—
Grenoble, Dane C.; Kim, Chang J.; and Murrell, Lawrence L., 4,440,872, Cl. 502-242.000.

Kim, Sung J.; Um, Ik W.; and Park, Won J., to Pacific Chemical Ind. Co., Ltd. 5-(4-Hydroxyphenyl) hydantoin derivatives. 4,440,934, Cl. 548-312.000.

Kimball, David V. Vibration apparatus with flexure means. 4,440,026, Cl. 73-663.000.

Kimball International, Inc.: *See*—
Bass, Steven C.; and Goeddel, Thomas W., 4,440,058, Cl. 84-1.260.

Kimberly-Clark Corporation: *See*—
Pomplun, William S.; and Grube, Herbert E., 4,440,898, Cl. 524-503.000.
Schmidt, George F., 4,440,838, Cl. 429-250.000.

Kimchi, Yigal: *See*—
Vardi, Isaih; Kimchi, Yigal; and Ben-Dror, Jonathan, 4,440,001, Cl. 62-475.000.

Kindel, Robert S., to Preformed Line Products Company. Dead-end appliance for linear bodies. 4,439,897, Cl. 24-115.00N.

King-Seeley Thermos Co.: *See*—
Seager, Richard H., 4,440,303, Cl. 206-509.000.

Kingery, Dan W. Cutting board with funneling effect. 4,440,385, Cl. 269-13.000.

Kingston, Samuel C.; Spencer, Billie M.; Zscheile, John W., Jr.; and Price, Robert, to Sperry Corporation. Triple bit non-coherent matched filter receiving system. 4,441,194, Cl. 375-96.000.

Kinoshita, Katsuharu: *See*—
Kurihara, Norimitsu; Kinoshita, Katsuharu; Watanabe, Masao; Sato, Toyohiro; and Kawazoe, Takashi, 4,440,033, Cl. 74-7.00A.

Kinumoto, Namio; Nakao, Takashi; Murase, Hiroshi; Okada, Shigemitsu; and Kawadoko, Shinichi, to Osaka Gas Company, Limited. Moving body and method of performing work within pipes with use of same. 4,440,194, Cl. 138-89.000.

Kinzig, Charles M.: *See*—
Gleasoe, John G.; Kinzig, Charles M.; and Bryan, Deborah L., 4,440,939, Cl. 549-548.000.

Kipela, Tauno B.: *See*—
Haataja, Bruce A.; Kipela, Tauno B.; Lund, Anders E.; and Hamilton, James F., 4,440,708, Cl. 264-109.000.

Kircher, Dieter: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, 4,440,454, Cl. 303-114.000.

Kirchner, Jerry K. Hitch assembly. 4,440,417, Cl. 280-478.00R.

Kishimoto, Shoji: *See*—
Kuzuna, Seiji; Kishimoto, Shoji; and Aono, Tetsuya, 4,440,691, Cl. 260-429.900.

Kissel, Ernst, deceased: *See*—
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst, deceased; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,439,933, Cl. 34-65.000.

Kissel, Gerd, legal representative: *See—*
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst, deceased; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,439,933, Cl. 34-65.000.

Kita, Yasuhiro; Tsukamoto, Nobuo; Koya, Masahiro; and Maeda, Narimichi, to Hitachi, Ltd. Signal processing system having impulse response detecting circuit. 4,441,192, Cl. 375-14.000.

Kitagawa Industries, Co., Ltd.: *See—*
Matsui, Kazuhiro, 4,439,896, Cl. 24-16.0PB.

Kitagawa, Jiro; and Mizutani, Isao, to NGK Insulators, Ltd. Apparatus for drying a ceramic green honeycomb body. 4,439,929, Cl. 34-1.000.

Kitahara, Tsuyoshi; Uchida, Masaaki; and Sone, Kohki, to Nissan Motor Company, Ltd. System for detection of air/fuel ratio in IC engine by using oxygen sensor operated with supply of current. 4,440,621, Cl. 204-406.000.

Kitasato Institute, The: *See—*
Kojima, Yasuhiko; Konno, Seishi; and Hashimoto, Takashi, 4,440,761, Cl. 424-195.000.

Kitchen, Robert D., to Honeywell Inc. Mounting system for panel mounted devices. 4,440,368, Cl. 248-27.100.

Kite, Oliver A., to BOC Group plc, The. Dissolving gas in a liquid. 4,440,645, Cl. 210-626.000.

Kittle, Carl E.; and Roach, James E., to Deere & Company. Multiple mode control lever assembly. 4,440,040, Cl. 74-527.000.

Kiyota, Kazushige: *See—*
Horiuchi, Tatsuo; and Kiyota, Kazushige, 4,441,144, Cl. 362-375.000.

Kiyoto, Michio: *See—*
Nakamura, Teruo; Kiyoto, Michio; Akashi, Kazuo; and Hasegawa, Isao, 4,440,560, Cl. 71-24.000.

Klagsbrun, Michael, to Children's Medical Center Corporation, The. Stimulating cell growth. 4,440,860, Cl. 435-240.000.

Klayman, Daniel L.: *See—*
Scovill, John P.; Klayman, Daniel L.; Massie, Samuel P.; Grant, Steven D.; Gonzalez, Armando; Morrison, Norman E.; and Dobek, Arthur S., 4,440,771, Cl. 424-258.000.

Kleefeldt, Frank, to Kiekert GmbH & Co. Kommanditgesellschaft. Antitheft central lock system for a motor vehicle. 4,440,006, Cl. 70-264.000.

Klein, Jurgen: *See—*
Henning, Klaus-Dirk; Klein, Jurgen; and Harder, Burkhard, 4,440,551, Cl. 55-73.000.

Klein, Martin. Lock position indicator. 4,440,011, Cl. 70-438.000.

Klie, Jurgen; and Stoll, Hans-Wolfgang, to G. Dusterloh GmbH. Hydrostatic actuator. 4,440,067, Cl. 91-491.000.

Klingensmith, Chester H.: *See—*
Dawless, Robert K.; LaCamera, Alfred F.; and Klingensmith, Chester H., 4,440,610, Cl. 204-67.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Abermeth, Hubert; Deckert, Andreas; Muller, Helmut; and Wahnschaffe, Jurgen, 4,440,126, Cl. 123-321.000.
Eckert, Rolf, 4,440,337, Cl. 228-173.00C.

Klotz, Warren C. Sponge mop with wringer. 4,439,885, Cl. 15-119.00A.

Klusman, Steven A., to General Motors Corporation. Squeeze film bearing mount. 4,440,456, Cl. 308-184.00R.

Knabe, Uwe, to Holstein & Kappert GmbH. Liquid discharge nozzle for container filling valves. 4,440,201, Cl. 141-286.000.

Knapp, Heinrich: *See—*
Felger, Guster; Glockler, Otto; Kauff, Helmut; Kiencke, Uwe; Knapp, Heinrich; and Stocker, Herbert, 4,440,131, Cl. 123-440.000.

Knight, Peter E., to Adrian Marsh Limited. Greeting cards. 4,440,298, Cl. 206-216.000.

Knoke, Silas J.; and Stamper, James F., to Lear Siegler, Inc. Locking assembly for a folding seat. 4,440,264, Cl. 182-126.000.

Knowles, Robert G., to Litton Systems, Inc. Fiber optic connectors. 4,440,471, Cl. 350-96.200.

Kobayashi, Atsushi: *See—*
Moriya, Yoshiaki; Mitani, Ryo; and Kobayashi, Atsushi, 4,441,031, Cl. 307-66.000.

Kobayashi, Hiroaki: *See—*
Asakura, Toshiyuki; Kobayashi, Hiroaki; and Noguchi, Yukio, 4,440,915, Cl. 525-537.000.

Kobayashi, Kozo; and Meguro, Hiromu, to Nakamichi Corporation. Method of correcting a position of a disk record on a turntable. 4,441,178, Cl. 369-270.000.

Kobayashi, Masahiro: *See—*
Suzuki, Yoshitsugu; Iizuka, Syogo; Kajiyama, Shigeo; Usui, Kenji; and Kobayashi, Masahiro, 4,440,053, Cl. 83-282.000.

Kobayashi, Nobuyuki; and Isobe, Toshiaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electronic fuel injecting method and device for internal combustion engine. 4,440,119, Cl. 123-492.000.

Kobayashi, Tetuo; and Hirai, Syoichi, to Nippon Cable System Inc. Automatic tension-adjusting mechanism for window regulators. 4,440,354, Cl. 242-54.00R.

Koch, Gerhard: *See—*
Frese, Elmar; and Koch, Gerhard, 4,440,642, Cl. 210-387.000.

Koch, Werner, to Bruckner Apparatebau GmbH. Apparatus for wet treatment of a length of textile material in hank form. 4,440,003, Cl. 68-22.00R.

Kocjan, Ana: *See—*
Djordjevic, Nebojsa; Rucman, Rudolf; Jovanovic, Suncica; Bole-Vunduk, Breda; Lavric, Tone; Lavric, Boza; Gruskovnjak, Cvetka; Kocjan, Ana; and Krmelj, Hermina, 4,440,772, Cl. 424-261.000.

Kockums Industri AB: *See—*
Ostberg, Sven E., 4,440,203, Cl. 144-39.000.

Kodama, Eiji: *See—*
Sakamoto, Takashi; Sano, Tetsuo; and Kodama, Eiji, 4,441,020, Cl. 250-202.000.

Koepnick, Siegfried: *See—*
Franz, Arnold; and Koepnick, Siegfried, 4,440,833, Cl. 428-425.100.

Koga, Hirohisa: *See—*
Ohba, Takeo; and Koga, Hirohisa, 4,441,128, Cl. 360-75.000.

Koh, Takuji: *See—*
Arichi, Isao; Waniisi, Tetuya; and Koh, Takuji, 4,440,503, Cl. 368-107.000.

Kohashi, Mamoru: *See—*
Tsujimura, Masakuni; Miyagi, Hideo; Kohashi, Mamoru; and Kurii, Masaaki, 4,440,141, Cl. 123-609.000.

Kohata, Mamoru: *See—*
Nakanishi, Toshihide; Kohata, Mamoru; and Sakurai, Minoru, 4,440,856, Cl. 435-111.000.

Kohler, Ulf, to Linden Alimak AB. Rack and pinion lift system. 4,440,266, Cl. 187-29.00R.

Kojima, Shigezo: *See—*
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,440,700, Cl. 264-8.000.

Kojima, Yasuhiko; Konno, Seishi; and Hashimoto, Takashi, to Kitasato Institute, The. Interferon inducer, a process for producing the same and pharmaceutical composition containing the same. 4,440,761, Cl. 424-195.000.

Kokkonen, Kim: *See—*
Folmsbee, Alan C.; Kokkonen, Kim; and Spaw, William J., 4,441,170, Cl. 365-200.000.

Kokochak, David G.: *See—*
Clancy, Terence J.; and Kokochak, David G., 4,440,121, Cl. 123-90.390.

Kolling, Georg: *See—*
Handrick, Kurt; Kolling, Georg; and Kiedel, Paul, 4,440,957, Cl. 585-323.000.

Kollmorgen Technologies Corporation: *See—*
Smith, James F., 4,441,068, Cl. 323-351.000.

Komada, Hideaki: *See—*
Terada, Tomohiko; and Komada, Hideaki, 4,440,132, Cl. 123-446.000.

Komeno, Taichiro: *See—*
Tsuji, Teruji; Hahashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,440,683, Cl. 260-239.00A.

Komoto, Shinsuke; and Haneishi, Yasuyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera lens barrel having retractable movable contacts. 4,440,484, Cl. 354-286.000.

Komura, Minoru; and Moriyama, Yasuhiro, to Nitto Electric Industrial Co., Ltd. Heat shrinkable material. 4,440,821, Cl. 428-195.000.

Konagaya, Takeshi; and Yagi, Yukinao, to Daiwa Can Company, Limited. Method for high speed leak test for metallic cover with a pull tab. 4,440,016, Cl. 73-40.000.

Konan Camera Research Institute: *See—*
Takahama, Sho, 4,440,491, Cl. 355-75.000.

Koncelik, Joseph A.; Chaney, David B.; Lockard, Walter G.; and Hontz, Thomas D., to Burlington Industries, Inc. Geriatric bed construction with sideguards. 4,439,880, Cl. 5-429.000.

Kondo, Hideo: *See—*
Katsumi, Ikuo; Kondo, Hideo; Yamashita, Katsuji; Hidaka, Takayoshi; Hosoe, Kazunori; Ariki, Yutaka; Yamashita, Toshiaki; and Watanabe, Kiyoshi, 4,440,784, Cl. 424-308.000.

Kondo, Hirokazu: *See—*
Murai, Masasumi; Kondo, Hirokazu; and Takino, Shigekatzu, 4,440,090, Cl. 104-127.000.

Konishi, Hiroo: *See—*
Sakurai, Takeichi; Goto, Kiyoshi; Konishi, Hiroo; and Kawai, Tadao, 4,441,032, Cl. 307-82.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Hatakeyama, Siro; Oba, Harutaro; and Ukai, Yoshitaka, 4,441,110, Cl. 346-140.00R.
Hitaka, Yosatomi; and Namiki, Takemasa, 4,440,811, Cl. 427-402.000.
Onishi, Akira; and Fujimori, Noboru, 4,440,852, Cl. 430-522.000.
Tosaka, Yasuo; and Ogi, Keiji, 4,440,851, Cl. 430-378.000.

Konno, Seishi: *See—*
Kojima, Yasuhiko; Konno, Seishi; and Hashimoto, Takashi, 4,440,761, Cl. 424-195.000.

Konopko, Matthew S., to Stone Container Corporation. Protective pads with self-locking panels and blank therefor. 4,440,304, Cl. 206-586.000.

Kontron AG: *See—*
Bussard, Adrien; Aldinger, Fritz; and Sperner, Franz, 4,440,178, Cl. 128-784.000.

Koomey, Inc.: *See—*
LeMoine, Joseph L., 4,440,232, Cl. 166-373.000.

Koppers, Manfred; Bohnes, Karlheinz; and Stephan, Bernhard, to Bochumer Eisenhutte Heintzmann GmbH & Co. Rock anchoring arrangement. 4,440,526, Cl. 405-260.000.

Kortbeek, Andras G. T. G.; Barre, Guy; and Durel, Jean M., to Shell Oil Company. Catalytic process for the production of hydrocarbons from syngas. 4,440,875, Cl. 518-728.000.

Kosak, Werner; and Matschinsky, Wolfgang, to Bayerische Motoren Werke Aktiengesellschaft. Individual wheel suspension for non-steered motor vehicle wheels exhibiting a change in camber when sprung, especially on automobiles. 4,440,419, Cl. 280-661.000.

Koski, Erkki; and Tapio, Olli, to Valmet Oy. Press section in a paper machine. 4,440,598, Cl. 162-305.000.
Kossa, Walter C.: *See*—
Allcock, Harry R.; Neenan, Thomas X.; and Kossa, Walter C., 4,440,921, Cl. 528-168.000.
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR. Method of making holes in the soil and apparatus for performing this method. 4,440,240, Cl. 175-20.000.
Kosubek, Uwe: *See*—
Tappe, Horst; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, 4,440,681, Cl. 260-207.100.
Kosuzume, Hiroshi: *See*—
Mochida, Ei; Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Kosuzume, Hiroshi, 4,440,770, Cl. 424-258.000.
Kotick, Michael P.; Leland, David L.; and Polazzi, Joseph O., to Miles Laboratories, Inc. 7β-Arylalkyl-3-methoxy or 3-hydroxy-4,5α-epoxy-6β-hydroxy-7α-hydroxymethyl-17-methyl or 17-cycloalkyl-methylmorphinans. 4,440,931, Cl. 546-44.000.
Kotick, Michael P.; and Leland, David L., to Miles Laboratories, Inc. 7β-Arylalkyl-7α-methyl-6-oxo or 6α-hydroxy-3-methoxy or 3-hydroxy-4,5α-epoxy-17-methyl or 17-cycloalkyl-methylmorphinans. 4,440,932, Cl. 546-44.000.
Kougioumoutzakis, Demetre, to Gouvernement du Quebec. Process for the recovery of sulfuric acid. 4,440,734, Cl. 423-549.000.
Kovach, Stephan M.: *See*—
Hettinger, William P., Jr.; Beck, Hubert W.; and Kovach, Stephan M., 4,440,868, Cl. 502-65.000.
Kowa Co., Ltd.: *See*—
Matsui, Ichiro; Tanaka, Tsutomu; Bando, Yukio; and Ohashi, Kiyonobu, 4,440,778, Cl. 424-274.000.
Koya, Masahiro: *See*—
Kita, Yasuhiro; Tsukamoto, Nobuo; Koya, Masahiro; and Maeda, Narimichi, 4,441,192, Cl. 375-14.000.
Koyama, Takaichi: *See*—
Tamai, Yasumasa; and Koyama, Takaichi, 4,440,339, Cl. 228-119.000.
Kozlov, Valery A.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.
Kozuki, Koichi; Nakada, Akira; and Yamada, Shigeru, to Nippon Gakki Seizo Kabushiki Kaisha. Envelope wave shape signal generator for an electronic musical instrument. 4,440,056, Cl. 84-1.260.
Krafft, Werner, to Agfa-Gevaert Aktiengesellschaft. Dye diffusion transfer process with development accelerators. 4,440,849, Cl. 430-239.000.
Krass, Dennis K.; and Richter, Sidney B., to PPG Industries, Inc. Herbicidally active quinoline or quinoxaline acetophenone oxime derivatives. 4,440,930, Cl. 544-354.000.
Krassnig, Manfred. Vending machine for flat articles. 4,440,313, Cl. 221-213.000.
Kraus, Charles E., to Excelermatic Inc. Fixed ratio traction roller transmission with tapered loading means. 4,440,043, Cl. 74-798.000.
Kraus, Gerard, to Phillips Petroleum Company. Asphalt compositions. 4,440,886, Cl. 524-68.000.
Kreinin, Efim V.; Zvyagimtsev, Kirill N.; and Fedorov, Nikolai A., to Vesojuzny Nauchno-Issledovatelsky Institut Ispolzovania Gaza V Narodnom Khozyaistve I Podzemnogo Khranenia Nefti, Nefteproduktov I Szhizhennykh Gazov (Vniipromgaz). Method of underground fuel gasification. 4,440,224, Cl. 166-245.000.
Krempl, Peter: *See*—
Ruckenbauer, Friedrich; Claassen, Peter; and Krempl, Peter, 4,441,044, Cl. 310-338.000.
Krimm, Heinrich; and Buysch, Hans-Josef, to Bayer Aktiengesellschaft. Cyclic carbonic acid derivatives. 4,440,937, Cl. 549-228.000.
Kritchevsky, David: *See*—
Scolastico, Carlo; Sirtori, Cesare; and Kritchevsky, David, 4,440,688, Cl. 260-397.100.
Krmelj, Hermina: *See*—
Djordjevic, Nebojsa; Rucman, Rudolf; Jovanovic, Suncica; Bole-Vunduk, Breda; Lavric, Tone; Lavric, Boza; Gruskovnjak, Cvetka; Kocjan, Ana; and Krmelj, Hermina, 4,440,772, Cl. 424-261.000.
Krogman, Stanley R.: *See*—
Edwards, Bryant; Krogman, Stanley R.; and McArdle, Edward J., 4,440,101, Cl. 111-2.000.
Krueger, Gordon P.: *See*—
Lund, Anders E.; Krueger, Gordon P.; and Sandberg, Lynn B., 4,440,287, Cl. 198-382.000.
Kruse, William A. Bag opener. 4,440,430, Cl. 294-1.00R.
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, to Toyota Jidoshs Kabushiki Kaisha. Torque converter lock up clutch shock absorber with pressure transmitting hole through disk element. 4,440,276, Cl. 192-3.290.
Kubota, Ltd.: *See*—
Kanazawa, Tatsuo; and Suyama, Tsuneo, 4,440,300, Cl. 206-446.000.
Kudo, Shozo: *See*—
Kawahara, Haruyuki; Makita, Teruo; Kudo, Shozo; and Funakoshi, Takashi, 4,440,878, Cl. 523-116.000.
Kuhn, John B.: *See*—
Wykhuis, Lloyd A.; and Kuhn, John B., 4,440,415, Cl. 280-460.00A.
Kulicke & Soffa Industries, Inc.: *See*—
Berkin, George M.; and Negin, Michael, 4,441,205, Cl. 382-8.000.
Kullen, Thomas W. Reinforced bicycle pack. 4,440,332, Cl. 224-36.000.
Kumai, Seisaku: *See*—
Oda, Yoshio; Uchida, Keiichi; Morimoto, Takeshi; and Kumai, Seisaku, 4,440,948, Cl. 562-532.000.
Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Hosaka, Sumio; Kawamura, Yoshio; and Terasawa, Tsuneo, to Hitachi, Ltd. Pattern detecting apparatus. 4,441,206, Cl. 382-08.000.
Kunz, Peter, to Mettler Instrumente AG. Scale with simplified guidance-damper construction. 4,440,251, Cl. 177-187.000.
Kuramochi, Koujiro: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,440,276, Cl. 192-3.290.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,440,757, Cl. 424-180.000.
Kurihara, Kazuhiko: *See*—
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,440,700, Cl. 264-8.000.
Kurihara, Norimitsu; Kinoshita, Katsuharu; Watanabe, Masao; Sato, Toyohiro; and Kawazoe, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Starting motor device. 4,440,033, Cl. 74-7.00A.
Kurii, Masaaki: *See*—
Tsujimura, Masakuni; Miyagi, Hideo; Kohashi, Mamoru; and Kurii, Masaaki, 4,440,141, Cl. 123-609.000.
Kurlander, Susan L.: *See*—
Hoffman, Louis S.; and Kurlander, Susan L., 4,440,311, Cl. 220-306.000.
Kurosaki, Toshiei: *See*—
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Kusters, Eduard: *See*—
Appenzeller, Valentin, 4,440,335, Cl. 226-107.000.
Kusuki, Yoshihiro: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,440,643, Cl. 210-500.200.
Kuwabara, Hideki: *See*—
Akiyama, Hiroyuki; Hirosawa, Kuninori; and Kuwabara, Hideki, 4,440,703, Cl. 264-50.000.
Kuze, Katsuaki; Matsuyama, Yuziro; Hashimoto, Hiroshi; Ohta, Takeshi; and Makimura, Osamu, to Toyo Boseki Kabushiki Kaisha. Process for production of polyester. 4,440,924, Cl. 528-275.000.
Kuzuna, Seiji; Kishimoto, Shoji; and Aono, Tetsuya, to Takeda Chemical Industries, Ltd. Indancarboxylic acid zinc salts. 4,440,691, Cl. 260-429.900.
Kwon, Young D.; Kavesh, Sheldon; and Prevorsek, Dusan C., to Allied Corporation. Method of preparing high strength and modulus polyvinyl alcohol fibers. 4,440,711, Cl. 264-185.000.
Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nakanishi, Toshihide; Kohata, Mamoru; and Sakurai, Minoru, 4,440,856, Cl. 435-111.000.
Kyushima, Tatsuo: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,440,276, Cl. 192-3.290.
L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques: *See*—
Bernard, Daniel, 4,441,139, Cl. 361-304.000.
L. & C. Steinmuller GmbH: *See*—
Michelfelder, Sigfrid; and Chughtai, M. Yaqub, 4,440,100, Cl. 110-343.000.
L. M. Becker & Co., Inc.: *See*—
Glaser, Robert L., 4,440,312, Cl. 221-24.000.
L. Schuler GmbH: *See*—
Weber, Heinz, 4,440,278, Cl. 192-18.00R.
La Farge Refractaires: *See*—
Brachet, Pierre; and Leduc, Gilbert, 4,440,099, Cl. 110-336.000.
LaBate, Micheal D. Ceramic insert. 4,440,534, Cl. 411-82.000.
Laboratorio Farmaceutico Quimico "LaFarquim, S.A.": *See*—
Bose, Ajay K.; Fernandez, Isabel F.; and Gala, Kanti J., 4,440,682, Cl. 260-239.00A.
LaCamera, Alfred F.: *See*—
Dawless, Robert K.; LaCamera, Alfred F.; and Klingensmith, Chester H., 4,440,610, Cl. 204-67.000.
Lacks Industries, Inc.: *See*—
Bramer, Charles, 4,440,039, Cl. 74-501.00M.
Lagano, Thomas; and Batchelor, William H., to Propane Carburetion Systems, Inc. Supplemental fuel supply device for I.C. engine. 4,440,137, Cl. 123-525.000.
Laib, Ronald J.: *See*—
Biblarz, Oscar; Miller, James A.; and Laib, Ronald J., 4,439,980, Cl. 60-39.060.
Laing, Robert, to Curtis & Marble Corp. Method of and apparatus for wrapping products. 4,439,975, Cl. 53-399.000.

Lalich, Michael J.: *See*—
Staggers, John O.; Banerji, Samir K.; and Lalich, Michael J., 4,440,568, Cl. 75-53.000.

Lamb, Gerald P. Power transmission for a Stirling hot gas engine. 4,439,985, Cl. 60-518.000.

Lancet, Michael S.; and Gorin, Everett, to Conoco Inc. Process for gasification of carbonaceous material. 4,440,546, Cl. 48-202.000.

Landenberger, Ulric, to General Motors Corporation. Chain motion measuring device. 4,440,023, Cl. 73-490.000.

Lang, John C., to Erwin Kampf GmbH & Co. Machine for separating and slitting thin sheet. 4,440,356, Cl. 242-56.500.

Lang, Thomas G. Semi-submerged ship construction. 4,440,103, Cl. 114-61.000.

Lange, William J.; and Gosser, Robert B., to Westinghouse Electric Corp. Vacuum circuit interrupter with on-line vacuum monitoring apparatus. 4,440,995, Cl. 200-144.00B.

Lange, Wolfgang: *See*—
Gerlach, Klaus; Lange, Wolfgang; and Loh, Dieter, 4,440,648, Cl. 210-759.000.

Langen, Marinus J. M., to H. J. Langen & Sons Limited. Conveyor. 4,440,294, Cl. 198-838.000.

Langenhorst, Gunter, to top-element Bauelemente fur Innenausbau + Raumgestaltung GmbH & Co. KG. Firecode door-casing element. 4,439,965, Cl. 52-211.000.

Langer, Alois A., to Mirowski, Mieczyslaw. Apparatus for combining pacing and cardioverting functions in a single implanted device. 4,440,172, Cl. 128-419.00D.

Lanting, Richard J.; and Rentz, Bruce A., to Westinghouse Electric Corp. Drawer glide mount. 4,440,455, Cl. 308-3.800.

Lasswell, Don L.: *See*—
Messineo, Salvatore B.; Lasswell, Don L.; and Yee, Joe, 4,440,607, Cl. 204-35.00N.

Laurent, Henry: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; and Wiechert, Rudolf, 4,440,684, Cl. 260-239.570.

Lavric, Boza: *See*—
Djordjevic, Nebojsa; Rucman, Rudolf; Jovanovic, Suncica; Bole-Vunduk, Breda; Lavric, Tone; Lavric, Boza; Gruskovnjak, Cvetka; Kocjan, Ana; and Krmelj, Hermina, 4,440,772, Cl. 424-261.000.

Lavric, Tone: *See*—
Djordjevic, Nebojsa; Rucman, Rudolf; Jovanovic, Suncica; Bole-Vunduk, Breda; Lavric, Tone; Lavric, Boza; Gruskovnjak, Cvetka; Kocjan, Ana; and Krmelj, Hermina, 4,440,772, Cl. 424-261.000.

Lawson, Daniel D.; and England, Christopher, to California Institute of Technology. Thermochemical generation of hydrogen and carbon dioxide. 4,440,733, Cl. 423-437.000.

Lawson, Maurice O.: *See*—
Minardi, John E.; Lawson, Maurice O.; von Ohain, Hans P.; and Salyer, Ival O., 4,439,988, Cl. 60-649.000.

Lear Siegler, Inc.: *See*—
Knoke, Silas J.; and Stamper, James F., 4,440,264, Cl. 182-126.000.

Lebecque, Maurice. Cartridge-type dispenser gun. 4,440,324, Cl. 222-326.000.

Le Carrou, Joseph. Process and devices for controlling the level of a liquid. 4,440,188, Cl. 137-2.000.

Lecomte, Jean-Claude, to Framatome. Eddy current apparatus including a probe arm pivoted for movement by centrifugal force for detecting faults in a metal plate. 4,441,078, Cl. 324-219.000.

Ledet, Stephen J., Jr.: *See*—
Bergeron, Hervin J., Jr., 4,440,343, Cl. 237-69.000.

Leduc, Gilbert: *See*—
Brachet, Pierre; and Leduc, Gilbert, 4,440,099, Cl. 110-336.000.

Lee, Ralph L.: *See*—
Collurafici, Francisco A.; and Lee, Ralph L., 4,440,431, Cl. 294-27.00H.

Lee, Thomas D.; and Brown, Richard E., to USV Pharmaceutical Corporation. Imidazoquinoxaline compounds. 4,440,929, Cl. 544-346.000.

Leflar, James A.; and Stanwood, Phillip C., to Western Solar Products, Inc. Zero gauge solar system. 4,440,152, Cl. 126-435.000.

Leggett & Platt, Incorporated: *See*—
Stevens, John E., 4,439,878, Cl. 5-29.000.

Leikam, Gary E.; Wierwille, Robert L.; and Wood, Rebecca S., to International Business Machines Corporation. Dynamic send queue modification system. 4,441,163, Cl. 364-900.000.

LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o.: *See*—
Djordjevic, Nebojsa; Rucman, Rudolf; Jovanovic, Suncica; Bole-Vunduk, Breda; Lavric, Tone; Lavric, Boza; Gruskovnjak, Cvetka; Kocjan, Ana; and Krmelj, Hermina, 4,440,772, Cl. 424-261.000.

Leland, David L.: *See*—
Kotick, Michael P.; Leland, David L.; and Polazzi, Joseph O., 4,440,931, Cl. 546-44.000.
Kotick, Michael P.; and Leland, David L., 4,440,932, Cl. 546-44.000.

Leland Stanford Junior University, Board of Trustees of the: *See*—
Michaels, Alan S.; Robertson, Channing R.; and Cohen, Stanley N., 4,440,853, Cl. 435-68.000.

Leloux, Arnoldus W., to Wavin B.V. Method and device for cooling molds. 4,439,990, Cl. 62-63.000.

Lemak, Nicholas S.: *See*—
Baldwin, David R.; and Lemak, Nicholas S., 4,441,195, Cl. 377-2.000.

LeMoine, Joseph L., to Koomey, Inc. Well pressure compensation for blowout preventers. 4,440,232, Cl. 166-373.000.

Lentino, Lynn E.: *See*—
Sauerwein, William D.; and Lentino, Lynn E., 4,440,238, Cl. 173-170.000.

Lenz, Michael: *See*—
Mundel, Gerald; and Lenz, Michael, 4,441,040, Cl. 307-491.000.

Les Cables de Lyon: *See*—
Naudet, Jacques, 4,440,974, Cl. 174-108.000.

Le Therisien, Louis, to Compagnie Francaise des Petroles. Process for bringing a body of water into communication with a tunnel. 4,440,524, Cl. 405-154.000.

Letraset Corp.: *See*—
Collins, Ronald B.; Dowzall, Martin E.; Smith, Brian J.; and Taylor, Geoffrey R., 4,440,590, Cl. 156-234.000.

Levinson, Lionel M., to General Electric Company. Solderable largely base metal electrodes for metal oxide varistors. 4,441,094, Cl. 338-21.000.

Levy, Samuel, to General Electric Company. Fluid self-steering railway vehicle truck. 4,440,094, Cl. 105-166.000.

Lew, Hyok S. Prestressed self-interlocking grille structure. 4,439,958, Cl. 52-86.000.

Lewandowski, Joseph T.: *See*—
Horowitz, Harold S.; and Lewandowski, Joseph T., 4,440,670, Cl. 252-518.000.

Lewiner, Jacques; Perino, Didier; and Hennion, Claude. Circuit breakers sensitive to leakage currents. 4,441,134, Cl. 361-45.000.

Lewis, Basil C., Jr.: *See*—
Carroll, Arthur E., II; Lewis, Basil C., Jr.; and Yeazel, Howard T., 4,439,918, Cl. 29-840.000.

Lewis, Donald H.: *See*—
Dhar, Hari P.; Bockris, John O.; and Lewis, Donald H., 4,440,611, Cl. 204-147.000.

LGZ Landis & Gyr Zug A.G.: *See*—
Moser, Jean-Frederic; and Baltes, Heinrich P., 4,441,138, Cl. 361-274.000.

Libowitz, George G.; Lynch, James F.; and Maeland, Arnulf J., to Allied Corporation. Room temperature reaction of vanadium-based alloys with hydrogen. 4,440,737, Cl. 423-644.000.

Libowitz, George G.: *See*—
Maeland, Arnulf J.; Libowitz, George G.; and Rak, George, 4,440,736, Cl. 423-644.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Schroder, Ernst, 4,441,041, Cl. 307-494.000.
Schussler, Hans, 4,441,180, Cl. 370-3.000.

Lilley, George M., to Allen, J. Warren, a part interest. Recovery in phosphate ore flotation process. 4,440,636, Cl. 209-10.000.

Lillie, Terrance L., to Pitney Bowes Inc. Local network interface with control processor & DMA controller for coupling data processing stations to common serial communications medium. 4,441,162, Cl. 364-900.000.

Lilyerd, J. R. Freeze-proof livestock watering device and method. 4,440,112, Cl. 119-73.000.

Linden Alimak AB: *See*—
Kohler, Ulf, 4,440,266, Cl. 187-29.00R.

Linge, Hermann: *See*—
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst, deceased; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,439,933, Cl. 34-65.000.

Link, Joseph, to Mostek Corporation. Integrated circuit package. 4,441,119, Cl. 357-74.000.

Linke, Gerda; Engelsmann, Dieter; Maas, Dieter; Bassler, Alfred; and Hackenberg, Hubert, to Agfa-Gevaert AG. Photographic roll film camera. 4,440,483, Cl. 354-212.000.

Lippits, Gerardus J. M.; Van Den Broek, Arnoldus J. M.; Op Het Veld, Adriaan J. G.; Dijkstra, Rinse; and De Jonge, Jelis, to U.S. Philips Corporation. Method of manufacturing a die for duplicating plastics information carriers. 4,440,586, Cl. 156-151.000.

List, Hans: *See*—
Ruckenbauer, Friedrich; Claassen, Peter; and Krempl, Peter, 4,441,044, Cl. 310-338.000.

Little, Roger G.; and Shanfield, Stanley R., to Spire Corporation. Ion beam coating apparatus. 4,440,108, Cl. 118-719.000.

Litton Industrial Products, Inc.: *See*—
Stevenson, Christopher T. S., 4,440,338, Cl. 228-2.000.

Litton Systems, Inc.: *See*—
Knowles, Robert G., 4,440,471, Cl. 350-96.200.

Lo, Anthony T. S. Light reflector unit for a photographic camera. 4,441,141, Cl. 362-17.000.

Lock, Brian E., to RCA Corporation. Concentricity measuring instrument. 4,439,925, Cl. 33-172.00D.

Lock, William E., to Corning Glass Works. Print transfer device for decorating machine. 4,440,589, Cl. 156-232.000.

Lockard, Walter G.: *See*—
Koncelik, Joseph A.; Chaney, David B.; Lockard, Walter G.; and Hontz, Thomas D., 4,439,880, Cl. 5-429.000.

Lockheed Missiles & Space Company, Inc.: *See*—
Conti, Raul J., 4,440,216, Cl. 165-117.000.

Loctite Corporation: *See*—
O'Connor, John T., 4,440,910, Cl. 525-295.000.

Loftin, Royal E.; and Son, Adelina J., to Halliburton Company. Well drilling and completion fluid composition. 4,440,649, Cl. 252-8.50C.

Logan, John B.: *See*—
Henslee, Samuel P.; Noronha, Pascal J.; and Logan, John B., 4,440,529, Cl. 408-1.00R.

Loh, Dieter: *See—*
Gerlach, Klaus; Lange, Wolfgang; and Loh, Dieter, 4,440,648, Cl. 210-759.000.
Lohman, Rune. Mold stripper. 4,440,210, Cl. 164-409.000.
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., to Union Carbide Corporation. Crystalline silicoaluminophosphates. 4,440,871, Cl. 502-214.000.
Lorenzi, Mario: *See—*
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Lork, Winfried: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,440,570, Cl. 75-121.000.
Losenhausen Maschinenbau AG: *See—*
Waschulewski, Hans-Georg, 4,440,034, Cl. 74-61.000.
Losert, Ewald: *See—*
Paul, John G.; Stark, Bernard P.; and Losert, Ewald, 4,440,850, Cl. 430-325.000.
Lottner, Josef. Nonskid assembly for preventing the sliding of an item. 4,440,186, Cl. 135-84.000.
Lougheed, Robert M.; and Mudge, Trevor N., to Environmental Research Institute of Michigan; and University of Michigan, Regents of the. Design rule checking using serial neighborhood processors. 4,441,207, Cl. 382-8.000.
Lover, Myron J., to Block Drug Company, Inc. Use of 4-aminosalicyclic acid as an anti-inflammatory agent. 4,440,763, Cl. 424-230.000.
Lowe, Jack G., to Burton Delingpole & Company Limited. Scaffolding devices. 4,439,900, Cl. 24-248.0SA.
Lowenfeld, Rudolf: *See—*
Tappe, Horst; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, 4,440,681, Cl. 260-207.100.
Luciw, Wolodymyr, to Sperry Corporation. Storage logic/array (SLA) circuit. 4,441,168, Cl. 365-154.000.
Lumalampan Aktiebolag: *See—*
Jonsson, Gunther, 4,440,729, Cl. 423-55.000.
Lund, Anders E.; Krueger, Gordon P.; and Sandberg, Lynn B., to Michigan Technological University, Board of Control of. Flake aligner including baffles supported on continuously moving conveyor. 4,440,287, Cl. 198-382.000.
Lund, Anders E.: *See—*
Haataja, Bruce A.; Kipela, Tauno B.; Lund, Anders E.; and Hamilton, James F., 4,440,708, Cl. 264-109.000.
Lundberg, Robert M. Apparatus and method for multiplying the output of a generating unit. 4,441,028, Cl. 290-52.000.
Lundblad, John L.: *See—*
Fernandes, Peter M.; and Lundblad, John L., 4,440,679, Cl. 260-122.000.
Lunder, Tito-Livio; and Nielsen, Corine-Madeleine, to Societe d'Assistance Technique pour Produits Nestle S.A. Cold soluble powdered tea extracts. 4,440,796, Cl. 426-597.000.
Lunghofer, Eugene P.; Mortensen, Sten; and Ward, Aubrey P., to A/S Niro Atomizer. Process for the production of sintered bauxite spheres. 4,440,866, Cl. 501-127.000.
Lunshof, Willem; and Beukers, Leonardus H. M., to Wavin B.V. Plastic bag comprising venting means. 4,441,209, Cl. 383-45.000.
Luo, Tatao, to Chevron Research Company. Herbicidal substituted 2-(1-(oxyamino)-alkylidene)-cyclohexane-1,3-diones. 4,440,566, Cl. 71-98.000.
Luppi, Libero, to Dideco S.p.A. Device for oxygenating blood circulating in an extracorporeal circuit with a heat exchanger. 4,440,722, Cl. 422-46.000.
Luz, David W., to RCA Corporation. Deflection circuit with linearity correction. 4,441,058, Cl. 315-371.000.
Lyall, Joseph G., to Armstrong World Industries, Inc. Screen registration device. 4,440,080, Cl. 101-129.000.
Lynch, James F.: *See—*
Libowitz, George G.; Lynch, James F.; and Maeland, Arnulf J., 4,440,737, Cl. 423-644.000.
Mª Gabilondo, Jose, to DLlama-Gabilondo y Cia, S.A. Revolver type firearms. 4,439,942, Cl. 42-66.000.
Maas, Dieter: *See—*
Linke, Gerda; Engelsmann, Dieter; Maas, Dieter; Bassler, Alfred; and Hackenberg, Hubert, 4,440,483, Cl. 354-212.000.
Mach, Joseph F.: *See—*
Flannery, James E.; Mach, Joseph F.; and Wexell, Dale R., 4,440,576, Cl. 106-85.000.
Machida, Kazumichi; and Inada, Yoshie, to Mitsubishi Denki Kabushiki Kaisha. Process of joining a contact. 4,441,006, Cl. 219-85.0CM.
Machizawa, Kenzi: *See—*
Mori, Akio; Watanabe, Shozo; Matsunaga, Mitsunobu; Machizawa, Kenzi; and Minowa, Ryohei, 4,439,999, Cl. 62-238.300.
Mack, Mark P.: *See—*
Shannon, Mark L.; and Mack, Mark P., 4,440,869, Cl. 502-104.000.
MacKenzie, Kenneth A., to Egg Marketing Board, The. Cultured egg-milk product. 4,440,791, Cl. 426-43.000.
Macklin, John J.; Silfvast, William T.; and Wood, Obert R., II, to Bell Telephone Laboratories, Incorporated. Foil electrode SPER light source. 4,441,189, Cl. 372-76.000.
Madan, Arun, to Energy Conversion Devices, Inc. P-Type semiconductor material having a wide band gap. 4,441,113, Cl. 357-2.000.
Madden, William M.; and Wiley, Walter H., to United Technologies Corporation. Simplified means for balancing the loads on a variable area nozzle. 4,440,347, Cl. 239-265.390.
Maeda, Narimichi: *See—*
Kita, Yasuhiro; Tsukamoto, Nobuo; Koya, Masahiro; and Maeda, Narimichi, 4,441,192, Cl. 375-14.000.
Mackawa, Takashi; Matsumoto, Shoji; and Matsui, Toshikazu, to Mita Industrial Company Limited. Cleaning device for an image-carrying member. 4,440,488, Cl. 355-15.000.
Maeland, Arnulf J.; Libowitz, George G.; and Rak, George, to Allied Corporation. Titanium-based body-centered cubic phase alloy compositions and room temperature hydride-forming reactions of same. 4,440,736, Cl. 423-644.000.
Maeland, Arnulf J.: *See—*
Libowitz, George G.; Lynch, James F.; and Maeland, Arnulf J., 4,440,737, Cl. 423-644.000.
Maglio, Michael J., to Pennwalt Corporation. Granular pesticide composition. 4,440,746, Cl. 424-78.000.
Magnetic Peripherals Inc.: *See—*
Shuman, Curtis A., 4,441,175, Cl. 369-45.000.
Magnuson, Roland A., to PACCAR Inc. Gun traverse apparatus. 4,440,061, Cl. 89-41.00H.
Mahlein, Hans: *See—*
Winzer, Gerhard; Mahlein, Hans; and Reichelt, Achim, 4,441,181, Cl. 370-3.000.
Maier, Franz; and Maier, Stephan, to BBC Brown, Boveri & Company, Limited. Process for the generation of high capacity pulses from an inductive energy storage device. 4,441,033, Cl. 307-107.000.
Maier, Stephan: *See—*
Maier, Franz; and Maier, Stephan, 4,441,033, Cl. 307-107.000.
Makabe, Toshiji: *See—*
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Makimura, Osamu: *See—*
Kuze, Katsuaki; Matsuyama, Yuziro; Hashimoto, Hiroshi; Ohta, Takeshi; and Makimura, Osamu, 4,440,924, Cl. 528-275.000.
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, to Ube Industries, Ltd. Process for producing aromatic polyimide composite separating membrane. 4,440,643, Cl. 210-500.200.
Makita, Teruo: *See—*
Kawahara, Haruyuki; Makita, Teruo; Kudo, Shozo; and Funakoshi, Takashi, 4,440,878, Cl. 523-116.000.
Maldonado, Robert; and Erickson, Raymond A., to Pennwalt Corporation. Apparatus for continuously automatically processing a plurality of dental X-ray films. 4,440,485, Cl. 354-322.000.
Maliszewski, Andrzej: *See—*
Johnson, Warren E.; and Maliszewski, Andrzej, 4,440,290, Cl. 198-479.000.
Maliszewski, Leonard A.: *See—*
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Mallinckrodt, Inc.: *See—*
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Fawzi, Mahdi B.; Benedict, James J.; Bugaj, Joseph E.; Degenhardt, Charles R.; and Van Duzee, Barry F., 4,440,738, Cl. 424-1.100.
Malmborg, Rolf: *See—*
Bergstrom, Hans R.; and Malmborg, Rolf, 4,440,495, Cl. 356-155.000.
Maloof, Ralph P.; and Reynolds, Roger R., Jr., to Reynolds & Taylor, Inc. Solar concentrating lens and receiver. 4,440,155, Cl. 126-440.000.
Manabe, Seiichi: *See—*
Fujiwara, Takashi; Kajita, Shuji; Matsushita, Tetsuo; and Manabe, Seiichi, 4,440,710, Cl. 264-184.000.
Mannesmann AG: *See—*
Gotting, Otto; Hess, Walter; and Nicolai, Franz, 4,440,533, Cl. 409-299.000.
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Frese, Elmar; and Koch, Gerhard, 4,440,642, Cl. 210-387.000.
Mansfield, Pete W. System for improving efficiency of screw presses. 4,440,076, Cl. 100-117.000.
Manson, Morris. Self-aligning drawer and slide bracket arrangement therefor and associated method. 4,440,462, Cl. 312-348.000.
Marcellis, Alphonso W.; and Johnson, Grannis S., to Diamond Shamrock Corporation. Polyhydroxy polyphenyl compounds as additives for cementitious materials. 4,440,577, Cl. 106-90.000.
Marchal, Paul: *See—*
Cornu, Jean; Detriche, Jean-Marie; Gil, Pierre; Marchal, Paul; and Vertut, Jean, 4,441,010, Cl. 219-124.340.
Mardiguian, Jean S., to Pharmindustrie. Heparin esters and processes for their preparation. 4,440,926, Cl. 536-21.000.
Margison, Alan B. Boat transporter. 4,440,409, Cl. 280-47.13B.
Margolin, George D.: *See—*
Azcua, Noris S.; Margolin, George D.; and Miller, Audrey, 4,441,160, Cl. 364-900.000.
Marine Resources Company, The: *See—*
Hilbertz, Wolf H., 4,440,605, Cl. 204-16.000.
Markley, Gerald E., to Exxon Research and Engineering Co. Catalytic reforming process. 4,440,627, Cl. 208-65.000.
Markley, Gerald E.: *See—*
Winter, William E.; and Markley, Gerald E., 4,440,626, Cl. 208-65.000.
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Marks, Christopher: *See—*
Gliha, Edward R., Jr.; and Marks, Christopher, 4,440,463, Cl. 339-14.00R.
Marquez, Joseph A.: *See—*
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Marra, Jerome F.: *See*—
Morrison, Michael W.; Fracker, Clarence E., Jr.; and Marra, Jerome F., 4,440,557, Cl. 65-3.100.
Marrujo, Ralph G.; and Cooper, Adrianus A. G., to Fairchild Industries, Inc. Energy attenuating seat and leg therefor. 4,440,441, Cl. 297-216.000.
Marschner, Frank W., to Colgate-Palmolive Company. Bicarbonate-containing stick deodorant. 4,440,741, Cl. 424-65.000.
Marschner, Frank W., to Colgate-Palmolive Company. Bicarbonate-containing stick deodorant. 4,440,742, Cl. 424-65.000.
Marshall, W. Ray. Free point indicator. 4,440,019, Cl. 73-151.000.
Martin, Albert E., to Conoco Inc. Downhole pump with safety valve. 4,440,231, Cl. 166-373.000.
Martin, Barrie J., to Eaton Corporation. Fuel injector. 4,440,344, Cl. 239-102.000.
Martin, Daniel B.: *See*—
Fletcher, Robert P.; and Martin, Daniel B., 4,441,155, Cl. 364-200.000.
Martin, Francis, to Pall Corporation. Coaxial bidirectional spool valve. 4,439,984, Cl. 60-454.000.
Martinaitis, Ionas J.: *See*—
Balchjunas, Povilas I.; Martinaitis, Ionas J.; Tulaba, Sauljus A.; and Pilkauskas, Alfredas B., 4,441,055, Cl. 315-288.000.
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Hicks, Alan A.; and Breslow, Jeffrey D., 4,440,394, Cl. 273-157.00R.
Marx, Matthias: *See*—
Nissen, Dietmar; Straehle, Wolfgang; and Marx, Matthias, 4,440,705, Cl. 264-53.000.
Maryland Wire Belts, Inc.: *See*—
Daringer, Ronald G., 4,440,367, Cl. 245-6.000.
Masco Corporation of Indiana: *See*—
Schrock, Donald C., 4,439,874, Cl. 4-300.000.
Maska, Rudolf, to PPG Industries, Inc. Process of making substantially external surfactant-free vinyl polymer emulsion products. 4,440,897, Cl. 524-460.000.
Masom, Ronald A., to Smiths Industries Public Limited Company. Liquid-level detection. 4,440,022, Cl. 73-293.000.
Masreliez, Carl J., to American Analytic Technology, Inc. Dental instrument heater. 4,441,013, Cl. 219-231.000.
Massachusetts Institute of Technology: *See*—
Milgram, Jerome H.; and Burgess, James, 4,440,523, Cl. 405-60.000.
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Scovill, John P.; Klayman, Daniel L.; Massie, Samuel P.; Grant, Steven D.; Gonzalez, Armando; Morrison, Norman E.; and Dobek, Arthur S., 4,440,771, Cl. 424-258.000.
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Weir, Donald R.; and Master, Ian M., 4,440,569, Cl. 75-120.000.
Masters, William E. Heater apparatus and method. 4,440,144, Cl. 126-61.000.
Masuda, Yoshinori, to Yoshida Kogyo K.K. Shuttleless loom. 4,440,197, Cl. 139-431.000.
Masumoto, Hakaru; and Murakami, Yuetsu, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. Magnet alloy useful for a magnetic recording and reproducing head and a method of manufacturing thereof. 4,440,720, Cl. 420-459.000.
Mather, Douglas E.; Messenger, Edward T.; and Phillips, Brinley M., to Albright & Wilson Limited. Concentrated aqueous surfactant compositions. 4,440,665, Cl. 252-356.000.
Matheson, Charles L., to Cummins Engine Company, Inc. Valve assembly. 4,440,193, Cl. 137-558.000.
Mathieu, Julien C., to Dayco Corporation. Wear member for railway vehicle. 4,440,095, Cl. 105-225.000.
Matner, Martin: *See*—
Heins, Ferdinand; Matner, Martin; and Striegler, Hellmut, 4,440,895, Cl. 524-822.000.
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Matsuda, Masatoshi: *See*—
Togari, Osamu; Matsuda, Masatoshi; Shimokawa, Kenji; and Makabe, Toshiji, 4,440,631, Cl. 208-112.000.
Matsui, Ichiro; Tanaka, Tsutomu; Bando, Yukio; and Ohashi, Kiyonobu, to Kowa Co., Ltd. Anti-inflammatory analgesic cataplasm and process for producing the same. 4,440,778, Cl. 424-274.000.
Matsui, Kanenobu; Uchiumi, Shinichiro; Asada, Hideki; and Umezu, Takashi, to Ube Industries, Ltd. Process for preparation of uracils. 4,440,928, Cl. 544-309.000.
Matsui, Kazuhiro, to Kitagawa Industries, Co., Ltd. Clamp for a bundle of cables. 4,439,896, Cl. 24-16.0PB.
Matsui, Takeshi: *See*—
Ogawa, Tsuneo; Ikeda, Manabu; Miyakawa, Seii; Iijima, Kazunori; Terayama, Takao; and Matsui, Takeshi, 4,441,133, Cl. 360-130.220.
Matsui, Toshikazu: *See*—
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Matsuki, Hideo: *See*—
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Matsumoto, Tadayuki; Imaeda, Kozo; Mineo, Masatoshi; and Nakagawa, Kiyoshi, to Toray Industries, Inc. Method for producing an interlaced multi-filament yarn. 4,439,903, Cl. 28-258.000.
Matsunaga, Kenichi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,440,757, Cl. 424-180.000.
Matsunaga, Mitsunobu: *See*—
Mori, Akio; Watanabe, Shozo; Matsunaga, Mitsunobu; Machizawa, Kenzi; and Minowa, Ryohei, 4,439,999, Cl. 62-238.300.
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Matsuo, Yasushi: *See*—
Shimamori, Toru; Hattori, Yoshinori; and Matsuo, Yasushi, 4,440,707, Cl. 264-65.000.
Matsushita Electric Industrial Company, Limited: *See*—
Hayakawa, Yoshihiro; Yano, Tsutomu; Tachita, Ryobun; Fukukita, Hiroshi; Irioka, Kazuyoshi; and Fukumoto, Akira, 4,440,025, Cl. 73-642.000.
Miyano, Ryuzo; Uenishi, Haruyuki; Akatani, Hisashi; and Akamine, Takenori, 4,441,001, Cl. 200-308.000.
Mori, Kazuhiro; Misawa, Yoshihiko; Itemadani, Eiji; and Kabeshita, Akira, 4,440,355, Cl. 242-55.000.
Shibata, Jun; Yamada, Haruyasu; Mori, Toshiki; and Takemoto, Toyoki, 4,441,198, Cl. 377-78.000.
Matsushita, Tetsuo: *See*—
Fujiwara, Takashi; Kajita, Shuji; Matsushita, Tetsuo; and Manabe, Seiichi, 4,440,710, Cl. 264-184.000.
Matsuura, Tsuguo; Torii, Shunichi; and Shimizu, Tsuguo, to Hitachi, Ltd. Data processing system having ring-like connected multiprocessors relative to key storage. 4,441,152, Cl. 364-200.000.
Matsuyama, Yuziro: *See*—
Kuze, Katsuaki; Matsuyama, Yuziro; Hashimoto, Hiroshi; Ohta, Takeshi; and Makimura, Osamu, 4,440,924, Cl. 528-275.000.
Mattei, Frank V.; and Doddi, Namassivaya, to Ethicon, Inc. Synthetic absorbable hemostatic composition. 4,440,789, Cl. 424-78.000.
Mattel, Inc.: *See*—
Finney, Harold T., II, 4,441,104, Cl. 340-724.000.
Matthiessen, Hans: *See*—
Winkler, Jorg; Matthiessen, Hans; Warncke, Ernst; and Pasternack, Adalbert, 4,440,166, Cl. 128-204.220.
Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, to Ciba-Geigy Corporation. Process for producing triarylphosphites. 4,440,696, Cl. 260-976.000.
Mauser-Werke Oberndorf GmbH: *See*—
Hupp, Gerhard, 4,440,065, Cl. 89-191.00R.
Mavilor Systemes: *See*—
Coquillart, Michel, 4,439,913, Cl. 29-597.000.
Mayfran GmbH: *See*—
Frese, Elmar; and Koch, Gerhard, 4,440,642, Cl. 210-387.000.
Mayne-Banton, Veronica I.: *See*—
Aviram, Ari; Mayne-Banton, Veronica I.; and Srinivasan, Rangaswamy, 4,440,801, Cl. 427-54.100.
Mazenod, Francois P.: *See*—
Whitesides, George M.; Mazenod, Francois P.; and Wong, Chi-Huey, 4,440,854, Cl. 435-94.000.
Mazzola, Massimo; and Cipriani, Aldo, to SNIA VISCOSA S.p.A. Societa Nazionale Industria Applicaziono Viscosa. Liquid foams of reinforced unsaturated polyester resins and process for making the same. 4,440,876, Cl. 521-123.000.
McArdle, Edward J.: *See*—
Edwards, Bryant; Krogman, Stanley R.; and McArdle, Edward J., 4,440,101, Cl. 111-2.000.
McArthur, James R. System for stabbing well casing. 4,440,220, Cl. 166-85.000.
McCabe, Donald P.: *See*—
Fette, Bruce; Gibson, Rose M.; and McCabe, Donald P., 4,441,200, Cl. 381-36.000.
McCarthy, Walton W., to Entropy Dynamics. Solar apparatus and process. 4,440,861, Cl. 435-306.000.
McCarty, William J., to General Electric Company. Air conditioning heat pump system having an initial frost monitoring control means. 4,439,995, Cl. 62-156.000.
McClain, Dorothee M., to National Distillers and Chemical Corporation. Finely divided ionomer coated thermoplastic resin. 4,440,908, Cl. 525-196.000.
McConnell, Lorne D.; and Spencer, Edward M., to Brown Boveri Electric Inc. Segmented circuit breaker housing with rotatably adjustable bushing positions. 4,440,998, Cl. 200-148.00R.
McCormick, Mack H.; and Wild, Gene M., to Eli Lilly and Company. Purification of glycopeptide antibiotics using non-functional resins. 4,440,753, Cl. 424-124.000.
McCoy, William J., Jr. Protective devices. 4,441,025, Cl. 250-516.100.
McCrery, David N., Jr.; Hoerner, Harry J.; and Purlee, John W. Adjustable electrically controlled livestock marking apparatus. 4,440,078, Cl. 101-4.000.
McDonald, Ernest. Method for stringing a racquet. 4,439,908, Cl. 29-446.000.
McDonough, Kevin C.; Hayn, John W.; Bellay, Jeffrey D.; and Thaden, Robert C., to Texas Instruments Incorporated. Self-emulator microcomputer. 4,441,154, Cl. 364-200.000.
McEachern, James F., to United States of America, Navy. Very low frequency hydrophone calibration. 4,441,173, Cl. 367-13.000.
McGann, Rodney. Aircraft structure. 4,440,361, Cl. 244-36.000.
McGean-Rohco, Inc.: *See*—
Opaskar, Vincent C.; Beach, Sidney C.; and Zellner, Robert J., 4,440,608, Cl. 204-43.00S.

McGibbon, Gregor D.; and Yu, Kenneth K., to GTE Automatic Electric Incorporated. Current sink for DPT channel unit. 4,440,979, Cl. 179-16.0EA.
McGill, Howard L., to Schlumberger Technology Corporation. Full-bore well tester with hydrostatic bias. 4,440,230, Cl. 166-321.000.
McGraw-Edison Company: *See—*
Burmenko, Mark, 4,441,066, Cl. 320-48.000.
McLean, James D.: *See—*
VanEffen, Richard M.; McLean, James D.; and Decker, Dalton L., 4,440,603, Cl. 204-1.00T.
McMahon, Irven J., Jr., to Coe Manufacturing Company, The. Conveyor dryer and method of operation. 4,439,930, Cl. 34-15.000.
McMahon, Maurice T., to International Business Machines Corporation. Circuit arrangement which permits the testing of each individual chip and interchip connection in a high density packaging structure having a plurality of interconnected chips, without any physical disconnection. 4,441,075, Cl. 324-73.00R.
McQueen, Sidney J. Reversible bolt for firearms. 4,440,062, Cl. 89-128.000.
Mead Corporation, The: *See—*
Ames, Jack D.; and Smith, David W., 4,440,389, Cl. 271-251.000.
Bakx, Martinus C. M., 4,440,340, Cl. 229-40.000.
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,440,846, Cl. 430-138.000.
Mechanical Technology Incorporated: *See—*
Pinkus, Oscar; and Walowit, Jed A., 4,440,402, Cl. 277-80.000.
Medical Graphics Corporation: *See—*
Anderson, Stephen T.; and Anderson, Catherine A., 4,440,177, Cl. 128-719.000.
Medtronic: *See—*
Hudziak, Lawrence C.; and Hartlaub, Jerome T., 4,440,173, Cl. 128-419.0PG.
Meeker, Maurice R.: *See—*
Groteke, Daniel E.; and Meeker, Maurice R., 4,440,640, Cl. 210-237.000.
Mees, Bernhard: *See—*
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Meguro, Hiromu: *See—*
Kobayashi, Kozo; and Meguro, Hiromu, 4,441,178, Cl. 369-270.000.
Mehnert, Walter: *See—*
Chaborski, Heiko; and Mehnert, Walter, 4,441,107, Cl. 340-870.160.
Meinard, Colette: *See—*
Herve, Jean-Jacques; Suglia, Jean-Claude; and Meinard, Colette, 4,440,756, Cl. 424-174.000.
Meindl, Hubert: *See—*
Strasilla, Dieter; Meindl, Hubert; Moldovanyi, Laszlo; and Fearnley, Charles, 4,440,744, Cl. 424-70.000.
Melchior, Bernd, to Imchemie Kunststoff GmbH. Solar concentrator. 4,440,153, Cl. 126-438.000.
Meloy Laboratories, Inc.: *See—*
Braude, Irwin A., 4,440,675, Cl. 260-112.00R.
Memorial Hospital for Cancer and Allied Diseases: *See—*
Miodownik, Saul, 4,440,176, Cl. 128-708.000.
Menard, Paul R.: *See—*
Suh, John T.; Menard, Paul R.; and Jones, Howard, 4,440,941, Cl. 560-20.000.
Mendelson, Robert M., to RCA Corporation. Self-extinguishing load driving system. 4,441,069, Cl. 323-239.000.
Menoret, Philippe: *See—*
Facoetti, Hugues; Menoret, Philippe; Micheron, Francois; Petit, Patrick; and Ravinet, Pierre, 4,440,983, Cl. 179-110.00A.
Merck & Co., Inc.: *See—*
Baldwin, John J., 4,440,774, Cl. 424-267.000.
Budavari, John, 4,440,942, Cl. 560-40.000.
Doherty, James B.; Dorn, Conrad P.; Witzel, Bruce E.; Allison, Debra L.; and Shen, Tsung-Ying, 4,440,779, Cl. 424-274.000.
Fix, Joseph A.; and Pogany, Stefano A., 4,440,740, Cl. 424-1.100.
Graham, Amy C., 4,440,748, Cl. 424-92.000.
Prugh, John D., 4,440,927, Cl. 549-292.000.
Zupan, Jacob A., 4,440,777, Cl. 424-274.000.
Merillat Industries, Inc.: *See—*
Merillat, Orville D., 4,439,888, Cl. 16-286.000.
Merillat, Orville D., to Merillat Industries, Inc. Substantially concealed hinge for door with recess. 4,439,888, Cl. 16-286.000.
Merit Abrasive Products, Inc.: *See—*
Block, Aleck; and Carlson, Arthur F., 4,439,907, Cl. 29-432.100.
Block, Aleck; and Hasegawa, Hiroshi, 4,439,953, Cl. 51-389.000.
Messenger, Edward T.: *See—*
Mather, Douglas E.; Messenger, Edward T.; and Phillips, Brinley M., 4,440,665, Cl. 252-356.000.
Messina, Celeste A.: *See—*
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 4,440,871, Cl. 502-214.000.
Messineo, Salvatore B.; Lasswell, Don L.; and Yee, Joe, to Kaiser Steel Corporation. Method of producing tin plate for lithography with direct printed ultraviolet-cured inks. 4,440,607, Cl. 204-35.00N.
Metro, Stephen J.; and Carr, Dale D., to Exxon Research and Engineering Co. Synthetic ester lubricating oil composition containing particular t-butylphenyl substituted phosphates and stabilized hydrolytically with particular long chain alkyl amines. 4,440,657, Cl. 252-49.900.
Mettler Instrumente AG: *See—*
Kunz, Peter, 4,440,251, Cl. 177-187.000.
Sigg, Max, 4,440,250, Cl. 177-187.000.
Meyer, Donald A., to Meyer's Manufacturing Corp. Mineral supplement distributor. 4,440,111, Cl. 119-61.000.
Meyer, Jacques; and Scharen, Walter E., to Siegfried Aktiengesellschaft. Defoliant composition and method. 4,440,561, Cl. 71-70.000.
Meyer's Manufacturing Corp.: *See—*
Meyer, Donald A., 4,440,111, Cl. 119-61.000.
MIC Manufacturing and Machine Works Ltd.: *See—*
Stevens, Larry G. H.; Sweet, Edmund G. F.; and Vresk, Franklin V., 4,440,048, Cl. 81-440.000.
Michaels, Alan S.; Robertson, Channing R.; and Cohen, Stanley N., to Leland Stanford Junior University, Board of Trustees of the. Microbiological methods using hollow fiber membrane reactor. 4,440,853, Cl. 435-68 000.
Michelfelder, Sigfrid; and Chughtai, M. Yaqub, to L. & C. Steinmuller GmbH. Method of introducing additive into a reaction gas flow. 4,440,100, Cl. 110-343.000.
Micheron, Francois: *See—*
Facoetti, Hugues; Menoret, Philippe; Micheron, Francois; Petit, Patrick; and Ravinet, Pierre, 4,440,983, Cl. 179-110.00A.
Michigan Technological University, Board of Control of: *See—*
Haataja, Bruce A.; Kipela, Tauno B.; Lund, Anders E.; and Hamilton, James F., 4,440,708, Cl. 264-109.000.
Lund, Anders E.; Krueger, Gordon P.; and Sandberg, Lynn B., 4,440,287, Cl. 198-382.000.
Microdyne Corporation: *See—*
Woodworth, Donald J., 4,441,079, Cl. 329-131.000.
Micron Technology, Inc.: *See—*
Parkinson, Ward D., 4,441,125, Cl. 358-213.000.
Midland-Ross Corporation: *See—*
Sarvis, Robert E., 4,440,213, Cl. 165-47.000.
Mikiya, Toshio: *See—*
Takeuchi, Hirosato; and Mikiya, Toshio, 4,440,156, Cl. 126-443.000.
Mikoshiba, Koichi: *See—*
Nishida, Shigeo; Miyagi, Mitsunobu; and Mikoshiba, Koichi, 4,441,091, Cl. 333-242.000.
Milana, Emilio, to Fiat Auto S.p.A. Process and device for inspecting and checking the internal surface of a hollow cylindrical workpiece which has undergone mechanical working. 4,440,496, Cl. 356-241.000.
Mildenberger, Hilmar: *See—*
Willms, Lothar; Mildenberger, Hilmar; Gunther, Dieter; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,440,565, Cl. 71-93.000.
Miles Laboratories, Inc.: *See—*
Kotick, Michael P.; Leland, David L.; and Polazzi, Joseph O., 4,440,931, Cl. 546-44.000.
Kotick, Michael P.; and Leland, David L., 4,440,932, Cl. 546-44.000.
Milgram, Alvin, to Fairchild Camera & Instrument Corporation. Lift-off process for fabricating self-aligned contacts. 4,440,804, Cl. 427-91.000.
Milgram, Jerome H.; and Burgess, James, to Massachusetts Institute of Technology. Separating collector for subsea blowouts. 4,440,523, Cl. 405-60.000.
Millar, John B.: *See—*
Tong, Yit C.; Seligman, Peter M.; Clark, Graeme M.; Patrick, James F.; and Millar, John B., 4,441,202, Cl. 381-68.000.
Miller, Audrey: *See—*
Azcua, Noris S.; Margolin, George D.; and Miller, Audrey, 4,441,160, Cl. 364-900.000.
Miller Brewing Company: *See—*
Goldstein, Henry; Hoff, Joseph T.; Cronan, Charles L.; and Rao, Ch. S., 4,440,795, Cl. 426-592.000.
Miller, Granville G.: *See—*
Ivory, Dawn M.; Miller, Granville G.; Chance, Ronald R.; and Baughman, Ray H., 4,440,669, Cl. 252-518.000.
Miller, James A.: *See—*
Biblarz, Oscar; Miller, James A.; and Laib, Ronald J., 4,439,980, Cl. 60-39.060.
Miller, Jess. Anatomical device. 4,440,183, Cl. 128-79.000.
Miller, Richard F.; Go, Tony S.; and Wilson, George R., III, to Atlantic Richfield Co. Method of making corrosion inhibiting polyamine amides, the amides, and use therefor. 4,440,666, Cl. 252-392.000.
Miller, Richard F.: *See—*
Go, Ting S. L.; and Miller, Richard F., 4,440,625, Cl. 208-48.0AA.
Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Apparatus for splicing spun yarns. 4,439,978, Cl. 57-22.000.
Minardi, John E.; Lawson, Maurice O.; von Ohain, Hans P.; and Salyer, Ival O., to University of Dayton. Rankine cycle ejector augmented turbine engine. 4,439,988, Cl. 60-649.000.
Mineo, Masatoshi: *See—*
Matsumoto, Tadayuki; Imaeda, Kozo; Mineo, Masatoshi; and Nakagawa, Kiyoshi, 4,439,903, Cl. 28-258.000.
Minnesota Mining and Manufacturing Company: *See—*
Nelson, Norman E., 4,440,359, Cl. 242-199.000.
Packard, Thomas J., 4,440,258, Cl. 181-137.000.
Rice, David E.; and Ihlenfeld, Jay V., 4,440,918, Cl. 526-246.000.
Sorlien, Mark D., 4,441,017, Cl. 219-528.000.
Minolta Camera Kabushiki Kaisha: *See—*
Hoda, Takeo; Oyokota, Shigeru; Seigenji, Kiyoshi; and Taniguchi, Nobuyuki, 4,440,481, Cl. 354-171.000.
Yuasa, Yoshio, 4,440,489, Cl. 355-69.000.
Minowa, Ryohei: *See—*
Mori, Akio; Watanabe, Shozo; Matsunaga, Mitsunobu; Machizawa, Kenzi; and Minowa, Ryohei, 4,439,999, Cl. 62-238.300.

Miodownik, Saul, to Memorial Hospital for Cancer and Allied Diseases. Digitally programmable cardiac synchronized high frequency jet ventilator control system. 4,440,176, Cl. 128-708.000.

Mirowski, Mieczyslaw: *See—*
Langer, Alois A., 4,440,172, Cl. 128-419.00D.

Misawa, Yoshihiko: *See—*
Mori, Kazuhiro; Misawa, Yoshihiko; Itemadani, Eiji; and Kabeshita, Akira, 4,440,355, Cl. 242-55.000.

Mischenko, Nicholas; Parker, Robert R.; and Starai, Rudolph, to Bell & Howell Company. Slide tray position sensing arrangement for slide projector apparatus utilizing two slide tray types. 4,440,478, Cl. 353-25.000.

Mita Industrial Company Limited: *See—*
Maekawa, Takashi; Matsumoto, Shoji; and Matsui, Toshikazu, 4,440,488, Cl. 355-15.000.

Mitani, Ryo: *See—*
Moriya, Yoshiaki; Mitani, Ryo; and Kobayashi, Atsushi, 4,441,031, Cl. 307-66.000.

Mitchell, Howard L., to Exxon Research and Engineering Co. Organic salt compositions in extraction processes. 4,440,634, Cl. 208-310.00R.

MITEC Moderne Industrietechnik GmbH: *See—*
Chaborski, Hoiko; and Mehnert, Walter, 4,441,107, Cl. 340-870.160.

Mitel Corporation: *See—*
Demetriou, Andreas, 4,441,035, Cl. 307-200.00B.

Mitsubishi Chemical Industries, Limited: *See—*
Nitta, Issei; Fujimori, Shinichiro; Haruyama, Toshio; and Inoue, Shinya, 4,440,689, Cl. 260-397.400.
Terayama, Hiroshi; Morita, Yoshiharu; and Umezu, Kohei, 4,440,788, Cl. 424-320.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Iwata, Toshio, 4,440,129, Cl. 123-425.000.
Machida, Kazumichi; and Inada, Yoshie, 4,441,006, Cl. 219-85.0CM.

Mitsubishi Paper Mills, Ltd.: *See—*
Miyamoto, Shigehiko; and Watanabe, Yoshinobu, 4,440,827, Cl. 428-327.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Fujikake, Shiro; Kawamata, Motoo; and Tsuboi, Hikotada, 4,440,920, Cl. 528-128.000.

Mitter, Mathias. Method of uniformly applying liquid treating media to foraminous workpieces. 4,440,808, Cl. 427-244.000.

Miura, Kazuhiko: *See—*
Hattori, Tadashi; Ozaki, Tadashi; Ootsuka, Yoshinori; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,440,014, Cl. 73-35.000.

Miura, Makoto, to Canon Kabushiki Kaisha. Copying apparatus. 4,440,487, Cl. 355-14.00R.

Miyagi, Hideo: *See—*
Tsujimura, Masakuni; Miyagi, Hideo; Kohashi, Mamoru; and Kurii, Masaki, 4,440,141, Cl. 123-609.000.

Miyagi, Mitsunobu: *See—*
Nishida, Shigeo; Miyagi, Mitsunobu; and Mikoshiba, Koichi, 4,441,091, Cl. 333-242.000.

Miyakawa, Seii: *See—*
Ogawa, Tsuneo; Ikeda, Manabu; Miyakawa, Seii; Iijima, Kazunori; Terayama, Takao; and Matsui, Takeshi, 4,441,133, Cl. 360-130.220.

Miyakoshi, Shinichi; and Yamamoto, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Rear wheel suspension for a motorcycle. 4,440,413, Cl. 280-284.000.

Miyamoto, Shigehiko; and Watanabe, Yoshinobu, to Mitsubishi Paper Mills, Ltd. Process for producing recording paper for ink jet recording and optical bar code printing. 4,440,827, Cl. 428-327.000.

Miyano, Ryuzo; Uenishi, Haruyuki; Akatani, Hisashi; and Akamine, Takenori, to Matsushita Electric Industrial Co., Ltd. Keyboard for inputting plural letters or symbols. 4,441,001, Cl. 200-308.000.

Miyazaki, Hajime, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece including a piezoelectric alarm. 4,440,504, Cl. 368-255.000.

Miyazaki, Haruhiko; Uda, Taizo; Hirai, Koichi; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, to UBE Industries, Ltd. Process for producing ethylene glycol and/or glycolic acid ester, catalyst composition used therefor, and process for production thereof. 4,440,873, Cl. 502-244.000.

Miyazaki, Shigeru: *See—*
Ishibashi, Junya; Miyazaki, Shigeru; and Tanaka, Shoichi, 4,440,511, Cl. 384-278.000.

Miyoshi, Takao; and Inami, Sumio, to Nissan Motor Company, Limited. Rear vehicle body structure of an automotive vehicle. 4,440,438, Cl. 296-195.000.

Mizuta, Masaji, to Dainippon Screen Seizo Kabushiki Kaisha. Control means for a drier. 4,439,931, Cl. 34-44.000.

Mizutani, Isao: *See—*
Kitagawa, Jiro; and Mizutani, Isao, 4,439,929, Cl. 34-1.000.

Mobil Oil Corporation: *See—*
Chang, Clarence D.; and Perkins, Patrick D., 4,440,668, Cl. 502-331.000.
Derbyshire, Francis J.; Varghese, Philip; and Whitehurst, Darrell D., 4,440,622, Cl. 208-8.0LE.
Gemmill, Robert M., Jr.; and Horodysky, Andrew G., 4,440,655, Cl. 252-47.500.
Holmes, Billy G., 4,440,227, Cl. 166-261.000.
Horodysky, Andrew G., 4,440,656, Cl. 252-49.600.
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,440,630, Cl. 208-111.000.
Piotrowski, Alfred B.; and Herd, Richard S., 4,440,658, Cl. 252-51.50A.

Mobil Solar Energy Corporation: *See—*
Stormont, Richard W.; and Eriss, Lawrence, 4,440,728, Cl. 422-246.000.

Mochida, Ei; Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Kosuzume, Hiroshi, to Mochida Seiyaku Kabushiki Kaisha. Diuretic, hypotensive and antiedemic quinoline oximes. 4,440,770, Cl. 424-258.000.

Mochida Seiyaku Kabushiki Kaisha: *See—*
Mochida, Ei; Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Kosuzume, Hiroshi, 4,440,770, Cl. 424-258.000.

Mode, Paul, to Nycoil Corporation. Releasable coupling device. 4,440,424, Cl. 285-39.000.

Moldovanyi, Laszlo: *See—*
Strasilla, Dieter; Meindl, Hubert; Moldovanyi, Laszlo; and Fearnley, Charles, 4,440,744, Cl. 424-70.000.

Moller, Toste W.: *See—*
Reiniger, Haigh M., 4,440,635, Cl. 209-4.000.

Monsanto Company: *See—*
Chupp, John P.; Alt, Gerhard H.; and Balthazor, Terry M., 4,440,964, Cl. 568-30.000.
Hobbs, Charles F., 4,440,967, Cl. 585-435.000.
Hobbs, Charles F., 4,440,968, Cl. 585-435.000.
Prill, Erhard J., 4,440,562, Cl. 71-86.000.

Montana Power Company, The: *See—*
Drain, Robert E., 4,441,135, Cl. 361-47.000.

Montgomery, Hugh S.: *See—*
Grantland, Gary; Montgomery, Hugh S.; Boeckmann, Eduard F. B.; and Woodworth, Larry A., 4,440,981, Cl. 179-81.00R.

Montoriol, Bernard, to Etablissements F. Valentin. Method of forming wiring for bottle stoppers. 4,440,199, Cl. 140-71.00R.

Montres Rado S.A.: *See—*
Gogniat, Paul, 4,440,505, Cl. 368-292.000.

Montzka, Thomas A., to Bristol-Myers Company. Process for preparing 1,2,5-thiadiazoles. 4,440,933, Cl. 546-193.000.

Moore Business Forms, Inc.: *See—*
Pennock, Thomas G., 4,440,341, Cl. 229-69.000.

Moore, Michael H.; Moss, Brian F.; and Turner, George F. A. M., to Ciba-Geigy AG. Combined masking frame and photographic sheet material container. 4,440,490, Cl. 355-72.000.

Moore, Neil A.: *See—*
Ray, Clifford H.; and Moore, Neil A., 4,441,174, Cl. 367-23.000.

Mori, Akio; Watanabe, Shozo; Matsunaga, Mitsunobu; Machizawa, Kenzi; and Minowa, Ryohei, to Hitachi, Ltd.; and Toyota Jidosha Kabushiki Kaisha. Absorption type refrigeration system. 4,439,999, Cl. 62-238.300.

Mori, Kazuhiro; Misawa, Yoshihiko; Itemadani, Eiji; and Kabeshita, Akira, to Matsushita Electric Industrial Co., Ltd. Electronic component supply apparatus. 4,440,355, Cl. 242-55.000.

Mori, Toshiki: *See—*
Shibata, Jun; Yamada, Haruyasu; Mori, Toshiki; and Takemoto, Toyoki, 4,441,198, Cl. 377-78.000.

Morii, Yoshikazu: *See—*
Takeda, Tsuneshi; Otsuji, Kazuya; Tamura, Junichi; Morii, Yoshikazu; Higashiwaki, Michio; and Nakatani, Yoshitaka, 4,440,732, Cl. 423-415.00P.

Morimoto, Takeshi: *See—*
Oda, Yoshio; Uchida, Keiichi; Morimoto, Takeshi; and Kumai, Seisaku, 4,440,948, Cl. 562-532.000.

Morimoto, Tsuyoshi, to Totoku Co., Ltd. Hermetical stopper for liquid receptacle. 4,440,309, Cl. 220-235.000.

Morinaga & Co., Ltd.: *See—*
Ohki, Katsumoto; Hirokawa, Tadahiko; and Sasaki, Hajime, 4,440,701, Cl. 264-15.000.

Morita, Shigetoshi; and Yamada, Hirohide, to Hitachi Metals, Ltd. Magnetic head device. 4,441,132, Cl. 360-126.000.

Morita, Yoshiharu: *See—*
Terayama, Hiroshi; Morita, Yoshiharu; and Umezu, Kohei, 4,440,788, Cl. 424-320.000.

Moriwaki, Yoshinaga; Horike, Masaki; and Kamiya, Masashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Concentricity evaluating system. 4,441,026, Cl. 250-561.000.

Moriya, Yoshiaki; Mitani, Ryo; and Kobayashi, Atsushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Power source voltage change discrimination circuit. 4,441,031, Cl. 307-66.000.

Moriyama, Yasuhiro: *See—*
Komura, Minoru; and Moriyama, Yasuhiro, 4,440,821, Cl. 428-195.000.

Morris, Charles H. F., Jr., to RCA Corporation. Method for the manufacture of lapping disc for forming keels on videodisc styli. 4,440,604, Cl. 204-5.000.

Morris, Claude W.: *See—*
Thomson, Donald W., 4,440,277, Cl. 192-12.00D.

Morrison, Michael W.; Fracker, Clarence E., Jr.; and Marra, Jerome F., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming and collecting continuous glass filaments. 4,440,557, Cl. 65-3.100.

Morrison, Norman E.: *See—*
Scovill, John P.; Klayman, Daniel L.; Massie, Samuel P.; Grant, Steven D.; Gonzalez, Armando; Morrison, Norman E.; and Dobek, Arthur S., 4,440,771, Cl. 424-258.000.

Mortensen, Sten: *See—*
Lunghofer, Eugene P.; Mortensen, Sten; and Ward, Aubrey P., 4,440,866, Cl. 501-127.000.

Morton, David H.; Szirmai, Stephen G.; and Potter, Edmund C., to Unisearch Limited; and Commonwealth Scientific and Industrial Research. Vapor coating of powders. 4,440,800, Cl. 427-13.000.

Moser, Jean-Frederic; and Baltes, Heinrich P., to LGZ Landis & Gyr Zug A.G. Charge cell. 4,441,138, Cl. 361-274.000.
Moss, Brian F.: *See*—
Moore, Michael H.; Moss, Brian F.; and Turner, George F. A. M., 4,440,490, Cl. 355-72.000.
Mostek Corporation: *See*—
Link, Joseph, 4,441,119, Cl. 357-74.000.
Motorola, Inc.: *See*—
Bocci, Paul M.; Sumner, Terence E.; and Wojnarowski, James R., 4,440,976, Cl. 179-1.50R.
Borras, Jaime A.; and Gonzalez, Ruben J., 4,441,098, Cl. 340-365.00R.
Brotherton, Carl R.; and Rendek, Peter M., 4,440,086, Cl. 102-254.000.
Davies, Robert B.; and Joseph, Eric D., 4,441,070, Cl. 323-268.000.
Fette, Bruce; Gibson, Rose M.; and McCabe, Donald P., 4,441,200, Cl. 381-36.000.
Mottier, Francois M., to United Technologies Corporation. Method of forming laser diffraction grating for beam sampling device. 4,440,839, Cl. 430-2.000.
Mowatt-Larsen, Erling; and Davis, Edward L., to General American Transportation Corporation. Container for pulverulent material. 4,440,528, Cl. 406-90.000.
MTU Motoren-und Turbinen-Union Munchen GmbH: *See*—
Weiler, Wolfgang; and Trappmann, Klaus, 4,439,981, Cl. 60-39.320.
Weiler, Wolfgang; and Trappmann, Klaus, 4,439,982, Cl. 60-39.320.
Mudder, Terrence I.; and Whitlock, James L., to Homestake Mining Company. Method for the biological removal of free and complex cyanides and thiocyanates from water. 4,440,644, Cl. 210-611.000.
Mudder, Wolfgang: *See*—
Keiter, Alfred; Mudder, Wolfgang; and Tappehorn, Bernd, 4,440,514, Cl. 400-208.000.
Mudge, Trevor N.: *See*—
Lougheed, Robert M.; and Mudge, Trevor N., 4,441,207, Cl. 382-8.000.
Mueller, Wolfgang: *See*—
Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, 4,440,887, Cl. 524-99.000.
Muench, Volker: *See*—
Naarmann, Herbert; Penzien, Klaus; Muench, Volker; and Franz, Klaus-Dieter, 4,440,693, Cl. 260-439.00R.
Muggli, Raymond A., to International Business Machines Corporation. CMOS Subsurface breakdown zener diode. 4,441,114, Cl. 357-13.000.
Muhlenbeck, Josef: *See*—
Vielstich, Gunther; Bauer, Hanns-Georg; Muhlenbeck, Josef; Otto, Josef; Feldhoff, Horst; Zollner, Dieter H.; and Rittmann, Friedrich, 4,441,190, Cl. 373-94.000.
Muller, Helmut: *See*—
Abermeth, Hubert; Deckert, Andreas; Muller, Helmut; and Wahnschaffe, Jurgen, 4,440,126, Cl. 123-321.000.
Muller, Henrik: *See*—
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; Muller, Henrik; Nyiro, Katalin; and Takacs, Ferenc, 4,440,619, Cl. 204-401.000.
Muller, Johann: *See*—
Hirtsiefer, Karl-Richard; Muller, Johann; Walterscheid, Kurt; and Wagner, Paul-Heinz, 4,440,046, Cl. 81-57.390.
Muller, Rudolf, to Bayerische Motoren Werke Aktiengesellschaft. Independent suspension of a steerable wheel to motor vehicles. 4,440,420, Cl. 280-691.000.
Munakata, Tomohiko; Isagai, Katsuyoshi; Ikeda, Yoshifumi; Sakai, Junichi; and Matsuki, Hideo, to Yoshotomi Pharmaceutical Industries Ltd. Antibiotics Y-16482 α and/or Y-16482 β, a process for production thereof, and a pharmaceutical composition containing either or both of them. 4,440,752, Cl. 424-118.000.
Mundel, Gerald; and Lenz, Michael, to Siemens Aktiengesellschaft GmbH. Integrable semiconductor circuit with a negatively fed-back, non-inverting operational amplifier. 4,441,040, Cl. 307-491.000.
Murai, Masasumi; Kondo, Hirokazu; and Takino, Shigekatzu, to Tsubakimoto Chain Company. Storage arrangement for truck conveyor trolleys. 4,440,090, Cl. 104-127.000.
Murakami, Yuetsu: *See*—
Masumoto, Hakaru; and Murakami, Yuetsu, 4,440,720, Cl. 420-459.000.
Murase, Hiroshi: *See*—
Kinumoto, Namio; Nakao, Takashi; Murase, Hiroshi; Okada, Shigemitsu; and Kawadoko, Shinichi, 4,440,194, Cl. 138-89.000.
Murata Kikai Kabushiki Kaisha: *See*—
Mima, Hiroshi, 4,439,978, Cl. 57-22.000.
Muri, Georges, to Shell-O-Matic Inc. Rainfall sander. 4,440,806, Cl. 427-180.000.
Murrell, Lawrence L.: *See*—
Grenoble, Dane C.; Kim, Chang J.; and Murrell, Lawrence L., 4,440,872, Cl. 502-242.000.
Muzak, Nicholas, to Stelco Inc. Method and apparatus for treating elongate materials. 4,439,991, Cl. 62-63.000.
Naarmann, Herbert; Penzien, Klaus; Muench, Volker; and Franz, Klaus-Dieter, to BASF Aktiengesellschaft. Preparation of electrically conductive products. 4,440,693, Cl. 260-439.00R.
Nabisco Brands, Inc.: *See*—
Horwath, Robert O.; and Colonna, William J., 4,440,855, Cl. 435-105.000.
Huang, Emil A., 4,440,798, Cl. 426-656.000.
Nadkarni, Anil V.; and Samal, Prasanna K., to SCM Corporation. Metal modified dispersion strengthened copper. 4,440,572, Cl. 75-232.000.
Nagata, Wataru: *See*—
Tsuji, Teruji; Hahashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,440,683, Cl. 260-239.00A.
Nagira, Norichika: *See*—
Ikegami, Hiroshi; Nagira, Norichika; and Yui, Katsuhiko, 4,440,583, Cl. 148-128.000.
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; and Tsuzuki, Kunihiro, to Nippondenso Co., Ltd. Vacuum control valve. 4,440,139, Cl. 123-569.000.
Nakada, Akira: *See*—
Kozuki, Koichi; Nakada, Akira; and Yamada, Shigeru, 4,440,056, Cl. 84-1.260.
Nakagawa, Akira: *See*—
Omura, Satoshi; and Nakagawa, Akira, 4,440,759, Cl. 424-180.000.
Nakagawa, Kiyoshi: *See*—
Matsumoto, Tadayuki; Imaeda, Kozo; Mineo, Masatoshi; and Nakagawa, Kiyoshi, 4,439,903, Cl. 28-258.000.
Nakai, Yoshiharu: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Nakai, Yoshiharu; and Sakane, Kazuo, 4,440,766, Cl. 424-246.000.
Nakamichi Corporation: *See*—
Kobayashi, Kozo; and Meguro, Hiromu, 4,441,178, Cl. 369-270.000.
Nakamura, Kazuo: *See*—
Suzuki, Toshiyuki; and Nakamura, Kazuo, 4,440,618, Cl. 204-298.000.
Nakamura, Teruo; Kiyoto, Michio; Akashi, Kazuo; and Hasegawa, Isao, to Japan Metals and Chemicals Co., Ltd. Mixed phosphatic fertilizer and process for producing the same. 4,440,560, Cl. 71-24.000.
Nakamura, Yasuo: *See*—
Miyazaki, Haruhiko; Uda, Taizo; Hirai, Koichi; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,440,873, Cl. 502-244.000.
Nakanishi, Toshihide; Kohata, Mamoru; and Sakurai, Minoru, to Kyowa Hakko Kogyo Co., Ltd. Process for producing L-glutamic acid. 4,440,856, Cl. 435-111.000.
Nakano, Jiro; and Watanabe, Yohei, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the idling rotational speed of an internal combustion engine. 4,440,128, Cl. 123-339.000.
Nakao, Kiyoharu; and Sato, Fumihide, to Kabushiki Kaisha Komatsu Seisakusho. Fuel injection system for internal combustion engines. 4,440,134, Cl. 123-447.000.
Nakao, Satoshi: *See*—
Taguchi, Yasuo; and Nakao, Satoshi, 4,440,130, Cl. 123-427.000.
Nakao, Takashi: *See*—
Kinumoto, Namio; Nakao, Takashi; Murase, Hiroshi; Okada, Shigemitsu; and Kawadoko, Shinichi, 4,440,194, Cl. 138-89.000.
Nakao, Toshihiro, to Olympus Optical Co., Ltd. Eject device of magnetic recording tape driving apparatus for tape cassette. 4,441,129, Cl. 360-96.500.
Nakatani, Yoshitaka: *See*—
Takeda, Tsuneshi; Otsuji, Kazuya; Tamura, Junichi; Morii, Yoshikazu; Higashiwaki, Michio; and Nakatani, Yoshitaka, 4,440,732, Cl. 423-415.00P.
Namiki, Takemasa: *See*—
Hitaka, Yosatomi; and Namiki, Takemasa, 4,440,811, Cl. 427-402.000.
Narisada, Masayuki: *See*—
Tsuji, Teruji; Hahashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,440,683, Cl. 260-239.00A.
Narita, Ryuho: *See*—
Oota, Hiroyuki; Aoshima, Terutaka; Yamamori, Kenji; and Narita, Ryuho, 4,441,016, Cl. 219-441.000.
Nassimbene, Ernie G., to International Business Machines Corporation. Keybar keyboard. 4,440,515, Cl. 400-479.000.
Nassof, Martin, to Simplex Ceiling Corp. Clip for metal planks. 4,439,973, Cl. 52-714.000.
Nat, Gursharan P. S., to Eaton Corporation. Pivoted actuator off lock switch with operator key nonremovable in ON position. 4,440,994, Cl. 200-42.00T.
Nath, Dilip K.; Pureza, Pablo C.; and Oh, Shin M., to Internaticnal Telephone and Telegraph Corporation. Fabrication of optical preforms by axial chemical vapor deposition. 4,440,558, Cl. 65-3.120.
Nath, Dilip K.: *See*—
Oh, Shin M.; Nath, Dilip K.; and Pureza, Pablo C., 4,440,556, Cl. 65-2.000.
Nathansohn, Giangiacomo; and Winters, Giorgio, to Gruppo Lepetit S.p.A. Water soluble esters of steroid-oxazole and pharmaceutical compositions containing them. 4,440,764, Cl. 424-241.000.
National Distillers and Chemical Corporation: *See*—
McClain, Dorothee M., 4,440,908, Cl. 525-196.000.
National Research Development Corporation: *See*—
Dobson, John V., 4,440,602, Cl. 204-1.00T.
Hamer, Arthur; and Pardoe, Beverley H., 4,441,060, Cl. 318-114.000.
National Semiconductor Corporation: *See*—
Ebel, Mark S., 4,441,172, Cl. 365-226.000.
Widlar, Robert J., 4,441,116, Cl. 357-43.000.
Naudet, Jacques, to Les Cables de Lyon. Electromechaнical cable for withstanding high temperatures and pressures, and method of manufacture. 4,440,974, Cl. 174-108.000.
Nauheimer, Vincent J. Disposable razor. 4,439,920, Cl. 30-47.000.

Neenan, Thomas X.: *See*—
Allcock, Harry R.; Neenan, Thomas X.; and Kossa, Walter C., 4,440,921, Cl. 528-168.000.
Neese, James A., to Sparton Corporation. Diaphragm horn. 4,441,099, Cl. 340-388.000.
Negin, Michael: *See*—
Berkin, George M.; and Negin, Michael, 4,441,205, Cl. 382-8.000.
Nelson, Norman E., to Minnesota Mining and Manufacturing Company. Cassette roller guide. 4,440,359, Cl. 242-199.000.
Nemoto, Kazuyuki, to Olympus Optical Co. Ltd. Reflex photometric assembly for camera. 4,440,479, Cl. 354-480.000.
Netherwood, Shelley: *See*—
Blackwell, Bernie; Netherwood, Shelley; and Piccolo, Dominick J., 4,440,790, Cl. 426-3.000.
Neuberger, Manfred, to Conpaten, Ltd. Playing or training device. 4,440,400, Cl. 273-411.000.
Neumann, Eckart: *See*—
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst, deceased; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,439,933, Cl. 34-65.000.
Neville Jr., David M.; and Youle, Richard J., to United States of America, Health and Human Services. Monoclonal antibody-ricin hybrids as a treatment of murine graft-versus-host disease. 4,440,747, Cl. 424-85.000.
Newell, Stephen T., to RCA Corporation. Damping mechanism for a video disc stylus holder. 4,441,176, Cl. 369-170.000.
Newnham, Rex E. Food supplement. 4,440,760, Cl. 424-184.000.
Newport, Ronald L.: *See*—
Gerchman, Robert D.; Newport, Ronald L.; and van Dyke, Martin J., 4,441,157, Cl. 364-551.000.
Neyenhouse, Peter A. Wet-based, wood-burning boiler. 4,440,145, Cl. 126-61.000.
Nezu, Tuguo: *See*—
Sugiura, Shinji; Fujii, Yasuhiro; Sato, Katsunori; Nezu, Tuguo; and Okumura, Yasumasa, 4,440,913, Cl. 525-443.000.
NGK Insulators, Ltd.: *See*—
Kitagawa, Jiro; and Mizutani, Isao, 4,439,929, Cl. 34-1.000.
NGK Spark Plug Co., Ltd.: *See*—
Shimamori, Toru; Hattori, Yoshinori; and Matsuo, Yasushi, 4,440,707, Cl. 264-65.000.
Nicolai, Franz: *See*—
Gotting, Otto; Hess, Walter; and Nicolai, Franz, 4,440,533, Cl. 409-299.000.
Niedballa, Ulrich; and Bottcher, Irmgard, to Schering Aktiengesellschaft. Antiinflammatory 4,5-diphenyl-2-substituted-thio-imidazoles and their corresponding sulfoxides and sulfones. 4,440,776, Cl. 424-273.00R.
Nielsen, Corine-Madeleine: *See*—
Lunder, Tito-Livio; and Nielsen, Corine-Madeleine, 4,440,796, Cl. 426-597.000.
Nihon Medi-Physics Co., Ltd.: *See*—
Azuma, Makoto; and Hazue, Masaaki, 4,440,739, Cl. 424-1.100.
Niihara, Toshihiro: *See*—
Shiihara, Takeo; Niihara, Toshihiro; Iwata, Hidemi; and Ishii, Noboru, 4,440,236, Cl. 173-8.000.
Nike, Inc.: *See*—
Clarke, Thomas E.; Peterson, William R.; and Parker, Mark G., 4,439,936, Cl. 36-102.000.
Nilssen, Ole K. High efficiency inverter & ballast circuits. 4,441,087, Cl. 331-113.00A.
Nioloux, Raymond, to Automotive Products Limited. Friction clutch driven plate. 4,440,283, Cl. 192-106.200.
Nippon Cable System Inc.: *See*—
Kobayashi, Tetuo; and Hirai, Syoichi, 4,440,354, Cl. 242-54.00R.
Nippon Carbon Co., Ltd.: *See*—
Ishikawa, Toshikatsu; Tanaka, Junichi; Teranishi, Haruo; Okamura, Tatsuya; and Hayase, Tokuji, 4,440,571, Cl. 75-229.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kozuki, Koichi; Nakada, Akira; and Yamada, Shigeru, 4,440,056, Cl. 84-1.260.
Nippon Kokan Kabushiki Kaisha: *See*—
Nomura, Hirokazu; and Sugitani, Yuji, 4,441,011, Cl. 219-124.340.
Takeshige, Kenji; Hirabe, Kenji; Ogawa, Yukifumi; Arikata, Kazuyoshi; Yako, Kazunori; Sakai, Kenichi; Matsuo, Toshinori; and Kamio, Hiroshi, 4,440,584, Cl. 148-128.000.
Nippon Oil Co., Ltd.: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,440,624, Cl. 208-22.000.
Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Ozaki, Tadashi; Ootsuka, Yoshinori; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,440,014, Cl. 73-35.000.
Nippon Steel Corporation: *See*—
Ikegami, Hiroshi; Nagira, Norichika; and Yui, Katsuhiko, 4,440,583, Cl. 148-128.000.
Nippondenso Co., Ltd.: *See*—
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; and Tsuzuki, Kunihiro, 4,440,139, Cl. 123-569.000.
Tsujimura, Masakuni; Miyagi, Hideo; Kohashi, Mamoru; and Kurii, Masaaki, 4,440,141, Cl. 123-609.000.
Nishida, Shigeo; Miyagi, Mitsunobu; and Mikoshiba, Koichi, to Hitachi Cable Ltd. Low loss leakage transmission line. 4,441,091, Cl. 333-242.000.
Nishikawa, Masaji, to Olympus Optical Company Ltd. Electrophotographic copying process for forming positive or negative images. 4,440,843, Cl. 430-55.000.
Nishikawa, Masaji, to Olympus Optical Company Ltd. Electrophotographic copying process involving simultaneous charging and imaging. 4,440,844, Cl. 430-55.000.
Nishioka, Jim Z. Archery bow. 4,440,143, Cl. 124-24.00R.
Nishiyama, Kozaburo: *See*—
Takeuchi, Shoji; Nishiyama, Kozaburo; and Gomi, Tadashi, 4,440,661, Cl. 252-89.100.
Nissan Motor Company, Limited: *See*—
Fukushima, Masao; and Yazaki, Komei, 4,440,375, Cl. 248-559.000.
Ikezawa, Kenji; Takao, Hiroshi; Ambe, Satoshi; and Uchida, Masaaki, 4,439,911, Cl. 29-570.000.
Ishimaru, Wataru; and Fujioka, Kazuyoshi, 4,440,282, Cl. 192-70.200.
Kitahara, Tsuyoshi; Uchida, Masaaki; and Sone, Kohki, 4,440,621, Cl. 204-406.000.
Miyoshi, Takao; and Inami, Sumio, 4,440,438, Cl. 296-195.000.
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yosuke, 4,440,254, Cl. 180-140.000.
Tanino, Mikio; and Shimada, Yukio, 4,440,212, Cl. 165-12.000.
Nissen, Dietmar; Straehle, Wolfgang; and Marx, Matthias, to BASF Aktiengesellschaft. Process for the preparation of cellular and non-cellular polyurethane elastomers. 4,440,705, Cl. 264-53.000.
Nitchman, Harold L.; and Cunningham, William B., Jr. System, apparatus, and method of dispensing a liquid from a semi-bulk disposable container. 4,440,319, Cl. 222-131.000.
Nitro Nobel Aktiebolag: *See*—
Haglund, Ingemar B.; and Westerlund, Nils A. L., 4,440,087, Cl. 102-275.110.
Nitta, Issei; Fujimori, Shinichiro; Haruyama, Toshio; and Inoue, Shinya, to Mitsubishi Chemical Industries, Limited. Acyloxysteroids and process for producing same. 4,440,689, Cl. 260-397.400.
Nitto Chemical Industry Co., Ltd.: *See*—
Yamaguchi, Yasumasa; Watanabe, Ichiro; and Satoh, Yoshiaki, 4,440,858, Cl. 435-129.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Komura, Minoru; and Moriyama, Yasuhiro, 4,440,821, Cl. 428-195.000.
Nitto Kohki Co., Ltd.: *See*—
Takeuchi, Hirosato; and Mikiya, Toshio, 4,440,156, Cl. 126-443.000.
Noguchi, Yukio: *See*—
Asakura, Toshiyuki; Kobayashi, Hiroaki; and Noguchi, Yukio, 4,440,915, Cl. 525-537.000.
Nomoto, Reishi; Takahashi, Masayoshi; and Ebata, Yoshikazu, to Janome Sewing Machine Co., Ltd. Suturing instrument and a method of holding a shuttle. 4,440,171, Cl. 128-335.500.
Nomura, Hirokazu; and Sugitani, Yuji, to Nippon Kokan Kabushiki Kaisha. Rotary arc-welding method. 4,441,011, Cl. 219-124.340.
Nordskog, Robert A. Headrest. 4,440,443, Cl. 297-397.000.
Noren, Torsten: *See*—
Hoberstorfer, Gustav; and Noren, Torsten, 4,440,448, Cl. 299-11.000.
Norlin, Stig I., to Saab-Scania Aktiebolag. Motor vehicle front section. 4,440,435, Cl. 296-188.000.
Noronha, Pascal J.: *See*—
Henslee, Samuel P.; Noronha, Pascal J.; and Logan, John B., 4,440,529, Cl. 408-1.00R.
Norrid, Kay L. Collapsible centerpiece. 4,440,812, Cl. 428-12.000.
Northern Telecom Limited: *See*—
Gibb, William D., 4,440,989, Cl. 179-99.00P.
Jackson, Prentiss W., 4,441,106, Cl. 340-811.000.
Shannon, Michael A., 4,440,596, Cl. 162-106.000.
Novatome: *See*—
Plagnard, Andre, 4,440,718, Cl. 376-269.000.
Novotny, Carl F., to Allis-Chalmers Corporation. Apparatus for delivering fluid to a rotating body. 4,440,351, Cl. 241-41.000.
Nozaki, Satoru, to SMK Electronics Corporation, USA. Membrane keyboard assembly. 4,440,990, Cl. 200-5.00A.
Nycoil Corporation: *See*—
Mode, Paul, 4,440,424, Cl. 285-39.000.
Nyiro, Katalin: *See*—
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; Muller, Henrik; Nyiro, Katalin; and Takacs, Ferenc, 4,440,619, Cl. 204-401.000.
Oakley, James C.: *See*—
Holtzberg, Matthew W.; Henke, Steven J.; Spaulding, Lawrence D.; and Oakley, James C., 4,440,069, Cl. 92-224.000.
Oba, Harutaro: *See*—
Hatakeyama, Siro; Oba, Harutaro; and Ukai, Yoshitaka, 4,441,110, Cl. 346-140.00R.
OBO Bettermann OHG, Firma: *See*—
Jordan, Ernst G., 4,441,007, Cl. 219-98.000.
Occidental Oil Shale, Inc.: *See*—
Hutchins, Ned M., 4,440,445, Cl. 299-2.000.
Hutchins, Ned M., 4,440,446, Cl. 299-2.000.
Ricketts, Thomas E., 4,440,444, Cl. 299-2.000.
Ricketts, Thomas E.; and Shaler, John E., 4,440,447, Cl. 299-2.000.
Ochi, Shigeharu, to Fuji Photo Film Co., Ltd. Photosensor pattern of solid-state imaging sensors. 4,441,123, Cl. 358-44.000.
Ocko, Stephen, to Data Packaging Corporation. Bean sprouter. 4,439,949, Cl. 47-61.000.
O'Connor, John T., to Loctite Corporation. Toughened cyanoacrylates containing elastomeric rubbers. 4,440,910, Cl. 525-295.000.
Oda, Yoshio; Uchida, Keiichi; Morimoto, Takeshi; and Kumai, Seisaku, to Asahi Glass Company, Ltd. Process for preparing methacrylic acid. 4,440,948, Cl. 562-532.000.

Oehlke, Donald N., to Eaton Corporation. Sheet metal fastener. 4,440,535, Cl. 411-112.000.
Oesterreichische Salen-Kunststoffwerk Gesellschaft m.b.H.: *See*—
Figwer, Eduard; and Schmitzberger, Franz, 4,440,345, Cl. 239-214.000.
Oettel, Friedrich H.: *See*—
Doctor, Alan P.; and Oettel, Friedrich H., 4,441,023, Cl. 250-338.000.
Ogawa, Tsuneo; Ikeda, Manabu; Miyakawa, Seii; Iijima, Kazunori; Terayama, Takao; and Matsui, Takeshi, to Hitachi, Ltd. Tape guide of magnetic recording and reproducing apparatus. 4,441,133, Cl. 360-130.220.
Ogawa, Yukifumi: *See*—
Takeshige, Kenji; Hirabe, Kenji; Ogawa, Yukifumi; Arikata, Kazuyoshi; Yako, Kazunori; Sakai, Kenichi; Matsuo, Toshinori; and Kamio, Hiroshi, 4,440,584, Cl. 148-128.000.
Ogi, Keiji: *See*—
Tosaka, Yasuo; and Ogi, Keiji, 4,440,851, Cl. 430-378.000.
Oh, Shin M.; Nath, Dilip K.; and Pureza, Pablo C., to International Telephone and Telegraph Corporation. Optical fiber drawing using plasma torch. 4,440,556, Cl. 65-2.000.
Oh, Shin M.: *See*—
Nath, Dilip K.; Pureza, Pablo C.; and Oh, Shin M., 4,440,558, Cl. 65-3.120.
O'Hare, Louis R. Thermal dielectric electric power generator. 4,441,067, Cl. 322-2.00A.
Ohashi, Kiyonobu: *See*—
Matsui, Ichiro; Tanaka, Tsutomu; Bando, Yukio; and Ohashi, Kiyonobu, 4,440,778, Cl. 424-274.000.
Ohba, Takeo; and Koga, Hirohisa, to Sony Corporation. Rotary transducer head assembly. 4,441,128, Cl. 360-75.000.
Ohhara, Minoru: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,440,757, Cl. 424-180.000.
Ohki, Katsumoto; Hirokawa, Tadahiko; and Sasaki, Hajime, to Morinaga & Co., Ltd. Method for forming viscous and plastically deformable food material into a globulin shape. 4,440,701, Cl. 264-15.000.
Ohmura, Yoshio: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,440,757, Cl. 424-180.000.
Ohnishi, Haruo: *See*—
Mochida, Ei; Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Kosuzume, Hiroshi, 4,440,770, Cl. 424-258.000.
Ohorodnik, Alexander; Keuper, Hans W.; Semmler, Horst; Hardel, Joachim; Vierling, Hermann; and Willms, Robert, to Hoechst Aktiengesellschaft. Process for making fine particulate non-agglomerating chloropolyethylene. 4,440,925, Cl. 528-487.000.
Ohta, Takeshi: *See*—
Kuze, Katsuaki; Matsuyama, Yuziro; Hashimoto, Hiroshi; Ohta, Takeshi; and Makimura, Osamu, 4,440,924, Cl. 528-275.000.
Okada, Shigemitsu: *See*—
Kinumoto, Namio; Nakao, Takashi; Murase, Hiroshi; Okada, Shigemitsu; and Kawadoko, Shinichi, 4,440,194, Cl. 138-89.000.
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hiroshi, to Polymer Processing Research Institute Ltd. Process for collecting centrifugally ejected filaments. 4,440,700, Cl. 264-8.000.
Okamura, Tatsuya: *See*—
Ishikawa, Toshikatsu; Tanaka, Junichi; Teranishi, Haruo; Okamura, Tatsuya; and Hayase, Tokuji, 4,440,571, Cl. 75-229.000.
Okayama, Yoshihiko: *See*—
Sasaki, Junichi; and Okayama, Yoshihiko, 4,441,161, Cl. 364-900.000.
Okazaki, Tasuku. Thermal fuse and the method of manufacturing the same. 4,441,093, Cl. 337-404.000.
Okumura, Yasumasa: *See*—
Sugiura, Shinji; Fujii, Yasuhiro; Sato, Katsunori; Nezu, Tuguo; and Okumura, Yasumasa, 4,440,913, Cl. 525-443.000.
Oldham, William G., to Siemens Aktiengesellschaft. Monolithically integrated circuit with connectible and/or disconnectible circuit portions. 4,441,036, Cl. 307-242.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., to Mobil Oil Corporation. Process for simultaneous hydrodesulfurization and hydrodewaxing with a catalyst of controlled pore size and metals content. 4,440,630, Cl. 208-111.000.
Olgiati, Gianni, to BBC Brown, Boveri & Company, Limited. Changeover switch for coaxial conductors. 4,441,089, Cl. 333-105.000.
Olin Corporation: *See*—
Fister, Julius C.; and Breedis, John F., 4,441,118, Cl. 357-70.000.
Reynolds, Don E.; and Pickering, James F., 4,440,614, Cl. 204-219.000.
Olschewski, Armin; Herrmann, Gerhard; and Bauer, Bernhard, to SKF Kugellagerfabriken GmbH. Seal assembly for bearing cups slidable in axial direction in bore. 4,440,401, Cl. 277-50.000.
Olsen, Judith D.: *See*—
Blakeslee, Marybelle C.; Olsen, Judith D.; and Romankiw, Lubomyr T., 4,440,609, Cl. 204-43.00T.
Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; and Becker, Thomas P., to Snap-on Tools Corporation. Luminosity probe for diesel engine timing apparatus. 4,441,021, Cl. 250-227.000.
Olympia Werke AG: *See*—
Keiter, Alfred; Mudder, Wolfgang; and Tappehorn, Bernd, 4,440,514, Cl. 400-208.000.
Olympus Optical Co., Ltd.: *See*—
Kanehira, Jun, 4,440,585, Cl. 148-403.000.
Nakao, Toshihiro, 4,441,129, Cl. 360-96.500.
Nemoto, Kazuyuki, 4,440,479, Cl. 354-480.000.
Nishikawa, Masaji, 4,440,843, Cl. 430-55.000.
Nishikawa, Masaji, 4,440,844, Cl. 430-55.000.
Ono, Noriaki; and Kamiyama, Takashi, 4,440,620, Cl. 204-403.000.
Osanai, Akira, 4,441,131, Cl. 360-119.000.
Shishido, Yoshio, 4,440,157, Cl. 128-6.000.
Omron Tateisi Electronics Co.: *See*—
Arichi, Isao; Waniisi, Tetuya; and Koh, Takuji, 4,440,503, Cl. 368-107.000.
Omura, Satoshi; and Nakagawa, Akira. 20-Amino tylosin derivatives and pharmaceutical compositions containing same. 4,440,759, Cl. 424-180.000.
Onishi, Akira; and Fujimori, Noboru, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material containing oxonal dyes. 4,440,852, Cl. 430-522.000.
Ono, Kuniaki, to Hitachi Shipbuilding & Engineering Company Limited. Apparatus for hoisting roll segments in continuous casting equipment. 4,440,211, Cl. 164-442.000.
Ono, Noriaki; and Kamiyama, Takashi, to Olympus Optical Co., Ltd. Measuring electrode device. 4,440,620, Cl. 204-403.000.
Ookouchi, Motomi: *See*—
Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, 4,441,083, Cl. 330-149.000.
Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, 4,441,084, Cl. 330-149.000.
Oota, Hiroyuki; Aoshima, Terutaka; Yamamori, Kenji; and Narita, Ryubo, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric rice cooker. 4,441,016, Cl. 219-441.000.
Ootsuka, Yoshinori: *See*—
Hattori, Tadashi; Ozaki, Tadashi; Ootsuka, Yoshinori; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,440,014, Cl. 73-35.000.
Op Het Veld, Adriaan J. G.: *See*—
Lippits, Gerardus J. M.; Van Den Broek, Arnoldus J. M.; Op Het Veld, Adriaan J. G.; Dijkstra, Rinse; and De Jonge, Jelis, 4,440,586, Cl. 156-151.000.
Opaskar, Vincent C.; Beach, Sidney C.; and Zellner, Robert J., to McGean-Rohco, Inc. Process and bath for the electrodeposition of tin-lead alloys. 4,440,608, Cl. 204-43.00S.
Oppelt, Peter; Uhlig, Uwe; Redeker, Werner; and Peschik, Werner, to Hauni-Werke Korber & Co. KG. Grinding machine. 4,439,951, Cl. 51-80.00R.
Oppitz, Peter: *See*—
von der Eltz, Hans-Ulrich; and Oppitz, Peter, 4,439,881, Cl. 8-151.000.
Orcon Corporation: *See*—
Hoopengardner, Merle C.; and Wenzel, William B., 4,439,904, Cl. 29-110.500.
Oretti, John E.: *See*—
Bayly, Peter K.; and Oretti, John E., 4,440,326, Cl. 222-450.000.
Orthoefer, Frank T.: *See*—
Bradford, Marion M.; Orthoefer, Frank T.; and Wright, Kenneth N., 4,440,792, Cl. 426-271.000.
Osaka Gas Company, Limited: *See*—
Kinumoto, Namio; Nakao, Takashi; Murase, Hiroshi; Okada, Shigemitsu; and Kawadoko, Shinichi, 4,440,194, Cl. 138-89.000.
Osanai, Akira, to Olympus Optical Co., Ltd. Magnetic head. 4,441,131, Cl. 360-119.000.
Osnabrucker Metallwerke J. Kampschulte GmbH & Co. KG: *See*—
Rossler, Kurt, 4,440,352, Cl. 241-152.00A.
Ostberg, Sven E., to Kockums Industri AB. Arrangement for inserting blocks of timber in a timber processing machine. 4,440,203, Cl. 144-39.000.
Ostendorf, Irene: *See*—
Beitler, Bruce; and Ostendorf, Irene, 4,440,373, Cl. 248-461.000.
Ostertag, Karl, to Akzo NV. Hollow filament module and method and apparatus for production of the same. 4,440,641, Cl. 210-321.300.
Otis Engineering Corporation: *See*—
Pullin, William H., 4,440,222, Cl. 166-117.500.
Taylor, Donald F.; and Boyle, William G., 4,440,221, Cl. 166-106.000.
Otsuji, Kazuya: *See*—
Takeda, Tsuneshi; Otsuji, Kazuya; Tamura, Junichi; Morii, Yoshikazu; Higashiwaki, Michio; and Nakatani, Yoshitaka, 4,440,732, Cl. 423-415.00P.
Otto, Eberhard: *See*—
Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, 4,440,696, Cl. 260-976.000.
Otto, Josef: *See*—
Vielstich, Gunther; Bauer, Hanns-Georg; Muhlenbeck, Josef; Otto, Josef; Feldhoff, Horst; Zollner, Dieter H.; and Rittmann, Friedrich, 4,441,190, Cl. 373-94.000.
Owen, Geoffrey R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,440,775, Cl. 424-269.000.
Owens-Corning Fiberglas Corporation: *See*—
Jenkins, Richard C., 4,439,960, Cl. 52-99.000.
Morrison, Michael W.; Fracker, Clarence E., Jr.; and Marra, Jerome F., 4,440,557, Cl. 65-3.100.
Uffner, William E., 4,440,816, Cl. 428-40.000.

Owens, John C.: *See—*
Barnett, Mark L.; and Owens, John C., 4,440,978, Cl. 179-5.500.
Oxon Italia S.P.A.: *See—*
Pallucca, Edoardo, 4,440,962, Cl. 568-933.000.
Oyokota, Shigeru: *See—*
Hoda, Takeo; Oyokota, Shigeru; Seigenji, Kiyoshi; and Taniguchi, Nobuyuki, 4,440,481, Cl. 354-171.000.
Ozaki, Tadashi: *See—*
Hattori, Tadashi; Ozaki, Tadashi; Ootsuka, Yoshinori; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,440,014, Cl. 73-35.000.
PACCAR Inc.: *See—*
Magnuson, Roland A., 4,440,061, Cl. 89-41.00H.
Pacific Chemical Ind. Co., Ltd.: *See—*
Kim, Sung J.; Um, Ik W.; and Park, Won J., 4,440,934, Cl. 548-312.000.
Packard, Thomas J., to Minnesota Mining & Manufacturing Company. Tunable stethoscope. 4,440,258, Cl. 181-137.000.
Paddock, Charles F., to Uniroyal, Inc. Laminate with skin based on AES graft copolymer. 4,440,825, Cl. 428-318.600.
Paelke, Jurgen: *See—*
Blattermann, Karl-Gunther; and Paelke, Jurgen, 4,440,537, Cl. 414-139.000.
Pall Corporation: *See—*
Martin, Francis, 4,439,984, Cl. 60-454.000.
Pallucca, Edoardo, to Oxon Italia S.P.A. Process for removing nitrosating agents from 1-chloro-2,6-dinitro-4-(trifluoromethyl) benzene. 4,440,962, Cl. 568-933.000.
Palmer, Bertram J., to GKN Transmissions Limited. Bearing and universal joint assembly. 4,440,256, Cl. 180-254.000.
Palmer, Richard F., to Phillips Petroleum Company. Polymer lubricants. 4,440,965, Cl. 585-12.000.
Pammer, Erich, to Siemens AG. Electrically insulating encapsulation composition for semiconductor arrangements. 4,440,883, Cl. 523-402.000.
Pao, John; and Tunzi, Burton R. Pushbutton decoder and printer. 4,440,977, Cl. 179-2.0DP.
Pardoe, Beverley H.: *See—*
Hamer, Arthur; and Pardoe, Beverley H., 4,441,060, Cl. 318-114.000.
Park, Won J.: *See—*
Kim, Sung J.; Um, Ik W.; and Park, Won J., 4,440,934, Cl. 548-312.000.
Parker, Mark G.: *See—*
Clarke, Thomas E.; Peterson, William R.; and Parker, Mark G., 4,439,936, Cl. 36-102.000.
Parker, Robert R.: *See—*
Mischenko, Nicholas; Parker, Robert R.; and Starai, Rudolph, 4,440,478, Cl. 353-25.000.
Parkinson, Ward D., to Micron Technology, Inc. Image sensor using dynamic random access memory. 4,441,125, Cl. 358-213.000.
Pasternack, Adalbert: *See—*
Winkler, Jorg; Matthiessen, Hans; Warncke, Ernst; and Pasternack, Adalbert, 4,440,166, Cl. 128-204.220.
Pate, Harold T.; and Fochler, Helmut P., to Indian Head Inc. Flexible conduit system. 4,440,425, Cl. 285-161.000.
Patel, Mahesh G.: *See—*
Waitz, Jay A.; Marquez, Joseph A.; Patel, Mahesh G.; and Horan, Ann C., 4,440,751, Cl. 424-114.000.
Patent-Treuhand-Gesellschaft Fur elektrische Gluhlampen mbH: *See—*
Steeger, Gerhard; and Plischke, Josef, 4,441,050, Cl. 313-493.000.
Patra AG: *See—*
Benson, Gustav E. V., 4,440,323, Cl. 222-209.000.
Patrick, James F.: *See—*
Tong, Yit C.; Seligman, Peter M.; Clark, Graeme M.; Patrick, James F.; and Millar, John B., 4,441,202, Cl. 381-68.000.
Patton, Robert L.: *See—*
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 4,440,871, Cl. 502-214.000.
Paul, John G.; Stark, Bernard P.; and Losert, Ewald, to Ciba-Geigy Corporation. Photopolymerisation process with two exposures of a single layer. 4,440,850, Cl. 430-325.000.
Pauli, Klaus: *See—*
Hahm, Gunter; Pauli, Klaus; and Schleicher, Walter, 4,440,437, Cl. 296-190.000.
Pavan, Gianni; and Lorenzi, Mario, to Ing. C. Olivetti & C., S.p.A. Electronic teleprinting apparatus including a removable programmed EPROM. 4,441,164, Cl. 364-900.000.
Pawlowski, Michael: *See—*
Pounder, Edwin; Arena, Alan J.; Pawlowski, Michael; and Totten, Adrian M., 4,440,030, Cl. 73-861.870.
Pearce, Roscoe L., to Dow Chemical Company, The. Process for removal of carbon dioxide from industrial gases. 4,440,731, Cl. 423-228.000.
Pearson, Mark L.: *See—*
Bassett, James H.; Christensen, Timothy F.; and Pearson, Mark L., 4,440,179, Cl. 130-27.0JT.
Pearson, Rune S. Method and apparatus for automatically extracting integrated circuit packages from electrical sockets. 4,439,917, Cl. 29-825.000.
Peerlkamp, Erik R., to Stamicarbon B.V. Polyolefin powder compositions, in particular polyethylene powder compositions, with improved adhesion, and objects made or to be made of such compositions. 4,440,899, Cl. 524-528.000.
Peinecke, Ludwig, to BASF Aktiengesellschaft. Container for at least one carrier member bearing a reeled tape-like recording medium, especially a magnetic tape cassette, and an assembly of two or more such containers. 4,440,299, Cl. 206-387.000.
Pennel, Jean-Francois; and Vesnier, Patrick H., to Pennell, Jean-Francois; and Centrale des Equipements Mobiliers et Immobiliers (CEMI). Coupling member. 4,440,519, Cl. 403-391.000.
Pennell, Jean-Francois: *See—*
Pennel, Jean-Francois; and Vesnier, Patrick H., 4,440,519, Cl. 403-391.000.
Pennock, Thomas G., to Moore Business Forms, Inc. Return envelope mailer. 4,440,341, Cl. 229-69.000.
Pennwalt Corporation: *See—*
Maglio, Michael J., 4,440,746, Cl. 424-78.000.
Maldonado, Robert; and Erickson, Raymond A., 4,440,485, Cl. 354-322.000.
Penny, Glenn S.: *See—*
Briscoe, James E.; Harris, Phillip C.; and Penny, Glenn S., 4,440,653, Cl. 252-8.55R.
Pentapharm, A.G.: *See—*
Svendsen, Lars G., 4,440,678, Cl. 260-112.50R.
Penzien, Klaus: *See—*
Naarmann, Herbert; Penzien, Klaus; Muench, Volker; and Franz, Klaus-Dieter, 4,440,693, Cl. 260-439.00R.
Pere, Gerard, to Creusot-Loire. Filter-press type electrolyzer. 4,440,615, Cl. 204-253.000.
Perino, Didier: *See—*
Lewiner, Jacques; Perino, Didier; and Hennion, Claude, 4,441,134, Cl. 361-45.000.
Perkins, Patrick D.: *See—*
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Perla, Henry L., to H.I.M. Inc. Divers weight belt. 4,440,525, Cl. 405-186.000.
Pernum, Bertil. Crawler-type transport apparatus. 4,440,253, Cl. 180-116.000.
Perry, Geoffrey A., to Gallagher-Kaiser Corp. Gas scrubbing device. 4,440,554, Cl. 55-241.000.
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Gunnell, Thomas J., 4,440,807, Cl. 427-221.000.
Kallenback, Lyle R.; and Jones, Faber B., 4,440,893, Cl. 524-305.000.
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Swanson, Billy L., 4,440,228, Cl. 166-274.000.
Swindell, Harold J.; and Thompson, Randall G., 4,440,725, Cl. 422-62.000.
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Piper, Paul P., Jr.: *See*—
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Poler, Stanley. Intra-ocular lens construction. 4,439,873, Cl. 3-13.000.
Pollard, John H.; and Ramsey, John B., Jr., to United States of America, Army. Infrared detector and method of making same. 4,439,912, Cl. 29-572.000.
Pollock, Mark A.; and Fleenor, Jimmie D., to Eastman Kodak Company. Process for the dispersion of chain extender in polyol. 4,440,664, Cl. 252-188.310.
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Pozin, Boris. Method of adjustment of printing machine inking device. 4,440,084, Cl. 101-365.000.
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Pruvot, Jean; and Roquefort, Andre, to Commissariat a l'Energie Atomique. Valve with a direct passage and rotary control. 4,440,382, Cl. 251-248.000.
Puchalski, Walter J., to Betz Laboratories, Inc. Paint spray booth detackification composition and method. 4,440,647, Cl. 210-712.000.
Pullin, William H., to Otis Engineering Corporation. Side pocket mandrel with improved orienting means. 4,440,222, Cl. 166-117.500.
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Oh, Shin M.; Nath, Dilip K.; and Pureza, Pablo C., 4,440,556, Cl. 65-2.000.
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Rahman, Mona A., to Honeywell Inc. Multiple input output electrical isolation for use with electronic integrated circuits. 4,441,072, Cl. 323-368.000.

Rainsford, Kim D.; and Whitehouse, Michael W., to Australian National University, The. Protection of the gastric mucosal lining from damage by aspirin and related drugs. 4,440,762, Cl. 424-230.000.

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Ramot University Authority for Applied Research and Industrial Development Ltd.: *See—*
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Ramsey, John B., Jr.: *See—*
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Rao, Ch. S.: *See—*
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Rasmussen, Ole-Bendt. Method of manufacturing reticular sheet. 4,440,709, Cl. 264-145.000.

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Raytheon Company: *See—*
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Susnjara, Kenneth J., 4,440,702, Cl. 264-37.000.
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Research Corporation: *See—*
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Resneau, Jean-Claude; Roset, Pierre; and Doyen, Jean, to Thomson-CSF. Substrate for a microwave electronic circuit and a method for the making of said substrate. 4,440,828, Cl. 428-334.000.

Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Vinyl ethers monomers and polymers therefrom. 4,440,917, Cl. 526-243.000.

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Reynolds, Don E.; and Pickering, James F., to Olin Corporation. Inlet end box brine pipe baffle. 4,440,614, Cl. 204-219.000.

Reynolds, Roger R., Jr.: *See—*
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Ribbing, Wilfried: *See—*
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Rice, David E.; and Ihlenfeld, Jay V., to Minnesota Mining and Manufacturing Company. Contact lens containing a fluorinated telechelic polyether. 4,440,918, Cl. 526-246.000.

Rice, Thomas E.; and Young, Peter T., to Haskell of Pittsburgh, Inc. Adjustable word processing table and the like. 4,440,096, Cl. 108-3.000.

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Richardson, Charles T., Jr., to Gladwin, Inc. Photo voltaic lighting for outdoor telephone booth. 4,441,143, Cl. 362-183.000.

Richardson, Gerry D.; and Cairo, Joseph A., to Baxter Travenol Laboratories, Inc. Liquid level controller for a respiratory gas humidifier device. 4,441,027, Cl. 250-577.000.

Richmond, Wesley Q., to Kennecott Corporation. Oxide refractory material having fine crystal structure; and process and apparatus for making same. 4,439,895, Cl. 23-305.00A.

Richter, Sidney B.: *See—*
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Rickel, Terri F.: *See—*
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Ricketts, Thomas E., to Occidental Oil Shale, Inc. Method for controlling void in an in situ oil shale retort. 4,440,444, Cl. 299-2.000.

Ricketts, Thomas E.; and Shaler, John E., to Occidental Oil Shale, Inc. Method for forming an in situ oil shale retort with explosive expansion towards a horizontal free face. 4,440,447, Cl. 299-2.000.

Ricoh Co., Ltd.: *See—*
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Riley, Dennis P., to Procter & Gamble Company, The. Rhodium-phosphine chiral hydrogenation catalysis of acetophenone, atropic acid,

and alpha-acylamidoacrylic acids and esters thereof. 4,440,936, Cl. 548-498.000.

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Roach, James D.; and Cole, Clinton W., to Halliburton Company. Packing arrangement. 4,440,404, Cl. 277-124.000.

Roach, James E.: *See*—
Kittle, Carl E.; and Roach, James E., 4,440,040, Cl. 74-527.000.

Robar, James D. J., to SED Systems Inc. Grain sensor. 4,441,101, Cl. 340-606.000.

Robbins, Christopher B. Uni-directional drive wrench. 4,440,047, Cl. 81-179.000.

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Eckert, Konrad, 4,440,124, Cl. 123-261.000.
Felger, Gunter; Glockler, Otto; Kauff, Helmut; Kiencke, Uwe; Knapp, Heinrich; and Stocker, Herbert, 4,440,131, Cl. 123-440.000.
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Best, David W.; and Russell, Jeffrey D., 4,441,182, Cl. 371-25.000.
Thornton, Jack C.; and Russell, Randy G., 4,441,092, Cl. 336-130.000.
Trcka, James S., 4,440,474, Cl. 350-345.000.

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Taylor, Michael J., 4,440,972, Cl. 174-72.00B.

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Dunkelberger, David L., 4,440,905, Cl. 525-66.000.

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Regenbrecht, Ludwig, 4,440,292, Cl. 198-774.000.

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Blakeslee, Marybelle C.; Olsen, Judith D.; and Romankiw, Lubomyr T., 4,440,609, Cl. 204-43.00T.

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Roof, Richard W.; and Berton, Kenneth S., to Square D Company. Pulse generating system. 4,441,063, Cl. 318-722.000.

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Pruvot, Jean; and Roquefort, Andre, 4,440,382, Cl. 251-248.000.

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Herve, Jean-Jacques; Suglia, Jean-Claude; and Meinard, Colette, 4,440,756, Cl. 424-174.000.

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Audino, Vincent, Jr.; and Russ, William P., 4,440,146, Cl. 126-77.000.

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Ryan, Dennis M.; and Hursey, Robert, to Ampex Corporation. Tape tensioning apparatus and method of assembly. 4,440,358, Cl. 242-189.000.

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Saab-Scania Aktiebolag: *See*—
Norlin, Stig I., 4,440,435, Cl. 296-188.000.

Saari, Veikko R., to Bell Telephone Laboratories, Incorporated. Amplifier with controlled gain. 4,441,080, Cl. 330-86.000.

SAB Automotive AB: *See*—
Karlsson, Sven I. K., 4,440,268, Cl. 188-79.50K.

Sabherwal, Inderjit H., to Ensotech, Inc. Calcined, high surface area, particulate matter, processes using this matter, and admixtures with other agents. 4,440,867, Cl. 502-62.000.

Sacks, Jacob M.: *See*—
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Sakamoto, Hideto, to Trio Kabushiki Kaisha. Signal amplifying apparatus. 4,441,085, Cl. 330-293.000.

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Sakurai, Minoru: *See*—
Nakanishi, Toshihide; Kohata, Mamoru; and Sakurai, Minoru, 4,440,856, Cl. 435-111.000.

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Salazar, Paul V. Refractory compositions and method. 4,440,865, Cl. 501-95.000.

Salplex Limited: *See*—
Hampshire, Michael J., 4,441,136, Cl. 361-88.000.

Salyer, Ival O.: *See*—
Minardi, John E.; Lawson, Maurice O.; von Ohain, Hans P.; and Salyer, Ival O., 4,439,988, Cl. 60-649.000.

Samal, Prasanna K.: *See*—
Nadkarni, Anil V.; and Samal, Prasanna K., 4,440,572, Cl. 75-232.000.

Sandberg, Lynn B.: *See*—
Lund, Anders E.; Krueger, Gordon P.; and Sandberg, Lynn B., 4,440,287, Cl. 198-382.000.

Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., to Mead Corporation. Photocopy sheet employing encapsulated radiator sensitive composition and imaging process. 4,440,846, Cl. 430-138.000.

Sanders, Ian L.: *See*—
Kabelac, William J.; and Sanders, Ian L., 4,441,166, Cl. 365-36.000.

Sanderson, John R.; Watts, Lewis W., Jr.; and Brader, Walter H., Jr., to Texaco Inc. Novel borate catalyst systems. 4,440,870, Cl. 502-207.000.

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Fliri, Hans; and Hamberger, Helmut, 4,440,767, Cl. 424-246.000.
Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, 4,440,887, Cl. 524-99.000.

Sangamo Weston, Inc.: *See—*
Boreas, Willem J. L., 4,440,271, Cl. 188-268.000.

Sanitation Equipment Limited: *See—*
Stewart, John M.; and Hewson, Clifford B., 4,439,875, Cl. 4-321.000.

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Santrade Ltd.: *See—*
Wiredal, Harry A. I., 4,440,244, Cl. 175-292.000.

Sanville, W. Woodward, to Servo Corporation of America. Speed independent system for obtaining preselected numbers of samples from object moving along fixed path. 4,441,196, Cl. 377-9.000.

Saran Protective Coating Company: *See—*
Smith, Noel A.; and Avallone, William J., 4,440,582, Cl. 148-6.15R.

Sarantakis, Dimitrios, to American Home Products Corporation. Nonapeptide anti-secretory agents. 4,440,904, Cl. 525-54.110.

Sarin, Vinod K.; and Buljan, Sergej-Tomislav, to GTE Laboratories Incorporated. Alumina coated silicon nitride cutting tools. 4,440,547, Cl. 51-295.000.

Sartor, Raymond W. Rotary earth drilling bit. 4,440,247, Cl. 175-393.000.

Sarvis, Robert E., to Midland-Ross Corporation. Recuperator with floating interior housing. 4,440,213, Cl. 165-47.000.

Sasaki, Hajime: *See—*
Ohki, Katsumoto; Hirokawa, Tadahiko; and Sasaki, Hajime, 4,440,701, Cl. 264-15.000.

Sasaki, Itsuo; and Suzuki, Hiroaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Static random access memory having a read out control circuit connected to a memory cell. 4,441,169, Cl. 365-190.000.

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Sassano, Daniel R., to Westinghouse Electric Corp. Adhesive oil resistant insulated wire consisting of two layers including an uncatalyzed epoxy-phenoxy resin outer layer. 4,439,914, Cl. 29-605.000.

Sassano, Salvatore. Take-down folding knife. 4,439,922, Cl. 30-161.000.

Sato, Fumihide: *See—*
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Sato, Katsunori: *See—*
Sugiura, Shinji; Fujii, Yasuhiro; Sato, Katsunori; Nezu, Tuguo; and Okumura, Yasumasa, 4,440,913, Cl. 525-443.000.

Sato, Takao; Ito, Tetsuo; and Arita, Setsuo, to Hitachi, Ltd. Method of controlling nuclear power plant. 4,440,715, Cl. 376-210.000.

Sato, Toyohiro: *See—*
Kurihara, Norimitsu; Kinoshita, Katsuharu; Watanabe, Masao; Sato, Toyohiro; and Kawazoe, Takashi, 4,440,033, Cl. 74-7.00A.

Sato, Yasunori: *See—*
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Sato, Yo; and Kashiwaba, Tadao, to Kabushiki Kaisha Sato. Portable type label applying apparatus. 4,440,592, Cl. 156-384.000.

Satoh, Yoshiaki: *See—*
Yamaguchi, Yasumasa; Watanabe, Ichiro; and Satoh, Yoshiaki, 4,440,858, Cl. 435-129.000.

Sauer, Herbert; and Gutlein, Gunter, to Fag Kugelfischer Georg Schafer & Co. Check valve for automotive braking system. 4,440,275, Cl. 188-352.000.

Sauer, Wolfgang; Aquila, Werner; Hoffmann, Wolfgang; Brenner, Karl; and Halbritter, Klaus, to BASF Aktiengesellschaft. Continuous preparation of 3-alkyl-buten-1-als. 4,440,960, Cl. 568-471.000.

Sauerwein, William D.; and Lentino, Lynn E., to Black & Decker Inc. Switch and handle construction for double-insulated electric tool. 4,440,238, Cl. 173-170.000.

Sawyer, Byron E.: *See—*
Joffe, Boris B.; Spongr, Jerry J.; and Sawyer, Byron E., 4,441,022, Cl. 250-308.000.

Saxon, John W. C., to Avdel Limited. Orientating device. 4,440,286, Cl. 198-380.000.

Scaggs, Orville C. Method and device for positioning and guiding pipe in a drilling derrick. 4,440,536, Cl. 414-22.000.

Scambos, Thomas T.: *See—*
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Scandpower, Inc.: *See—*
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Schachar, Ronald A. Method and device for measuring the optical power of the cornea. 4,440,477, Cl. 351-212.000.

Schaefer, Eberhard: *See—*
Dietrich, Ernst; Guenther, Ernst; Hoerauf, Werner; Kissel, Ernst, deceased; Linge, Hermann; Neumann, Eckart; and Schaefer, Eberhard, 4,439,933, Cl. 34-65.000.

Scharen, Walter E.: *See—*
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Schaub, Robert E.: *See—*
Upesiacis, Janis; Schaub, Robert E.; and Bernstein, Seymour, 4,440,758, Cl. 424-180.000.

Schaus, Jerome E.; and Danek, Daniel, to Dana Corporation. Hydrodynamic shaft seal with continuously divergent seal element. 4,440,405, Cl. 277-134.000.

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Scher, Herbert B., to Stauffer Chemical Company. Thiolcarbamate sulfoxides stabilized with butyrolactone and water. 4,440,563, Cl. 71-88.000.

Scherer, John S. Nail polish remover kit. 4,440,181, Cl. 132-73.500.

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Burba, Christian; Goeke, Ulrich; and Esper, Norbert, 4,440,900, Cl. 524-569.000.

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Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; and Wiechert, Rudolf, 4,440,684, Cl. 260-239.570.
Niedballa, Ulrich; and Bottcher, Irmgard, 4,440,776, Cl. 424-273.00R.

Schering Corporation: *See—*
Shapiro, Elliot L.; and Finkenor, Lawrence E., 4,440,690, Cl. 260-397.450.
Waitz, Jay A.; Marquez, Joseph A.; Patel, Mahesh G.; and Horan, Ann C., 4,440,751, Cl. 424-114.000.

Schibilla, Eduard: *See—*
Honolke, Friedrich; Brandl, Adrian; Schibilla, Eduard; and Hohne, Gerhard, 4,440,544, Cl. 44-51.000.

Schiel, Christian, to J. M. Voith GmbH. Press roller with adjustable bending characteristics. 4,440,077, Cl. 100-162.00B.

Schimmels, Kristin L. Protective child carrier assembly. 4,440,331, Cl. 224-31.000.

Schindler, Stefan R.: *See—*
Forster, Siegfried; Schindler, Stefan R.; and Pohlmann, Hans-Jurgen, 4,440,113, Cl. 122-16.000.

Schleicher, Walter: *See—*
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Schlumberger Technology Corporation: *See—*
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McGill, Howard L., 4,440,230, Cl. 166-321.000.

Schmelzer Corporation: *See—*
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Schmidt, Bruno H.; and Becker, Helmut. Device for producing boreholes in coal or the like. 4,440,242, Cl. 175-107.000.

Schmidt, George F., to Kimberly-Clark Corporation. Lead acid battery, separator therefor. 4,440,838, Cl. 429-250.000.

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Schmitt, Randal L.: *See—*
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Schmitzberger, Franz: *See—*
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Schneider, Fritz W., to Polyurethane Technology of America-Martin Sweets Company, Inc. High pressure impingement mixing apparatus. 4,440,500, Cl. 366-177.000.

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Schreiner, Friedrich, to Zahnradfabrik Friedrichshafen AG. Control system or method for a friction device such as a clutch or brake. 4,440,279, Cl. 192-30.00W.

Schrock, Donald C., to Masco Corporation of Indiana. Water closet rim and venting process therefor. 4,439,874, Cl. 4-300.000.

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Schulman, Melvin L. Ophthalmic surgical instrument. 4,440,169, Cl. 128-305.000.

Schulte Industries Ltd.: *See—*
Colistro, Vincent, 4,440,235, Cl. 171-63.000.

Schulz, Charles A.: *See—*
Boyer, Stanton L.; and Schulz, Charles A., 4,440,663, Cl. 252-174.110.

Schulz, Werner. Method of automatic adjustment of self-contained radio-clock by means of time mark. 4,440,501, Cl. 368-47.000.

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Boehm, Udo; Schulze-Berge, Klaus; and Brotzler, Roland, 4,441,130, Cl. 360-106.000.

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Schumacher, William L., to AMP Incorporated. Optical waveguide connector. 4,440,469, Cl. 350-96.200.

Schuppiser, Jean-Luc; and Daniel, Jean-Claude, to Rhone-Poulenc Specialties Chimiques. Process for the preparation of lattices of vinyl acetate polymers. 4,440,896, Cl. 524-458.000.

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Schuster, Stanley E., to International Business Machines Corporation. Input buffer circuit for semiconductor memory. 4,441,039, Cl. 307-475.000.

Schwartz, Richard S.: *See*—
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Schwarz, Gerhard E., to Braun Aktiengesellschaft. Circuit arrangement for the controlled supply to a load. 4,441,147, Cl. 363-21.000.

Schweiker, Werner: *See*—
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SCM Corporation: *See*—
Bonsack, James P., 4,440,730, Cl. 423-74.000.
Nadkarni, Anil V.; and Samal, Prasanna K., 4,440,572, Cl. 75-232.000.

Scolastico, Carlo; Sirtori, Cesare; and Kritchevsky, David. Novel derivatives of ursodeoxycholic acid. 4,440,688, Cl. 260-397.100.

Scovill, John P.; Klayman, Daniel L.; Massie, Samuel P.; Grant, Steven D.; Gonzalez, Armando; Morrison, Norman E.; and Dobek, Arthur S., to United States of America, Army. 2-Acetyl quinoline thiosemicarbazones useful in treatment of gonorrhea, malaria or bacterial infections. 4,440,771, Cl. 424-258.000.

Scranton, Joseph A., to Clauss Cutlery Company, a Division of Alco Standard Corporation, The. Snip ride. 4,439,923, Cl. 30-252.000.

Sea Energy Associates, Limited: *See*—
Bellamy, Norman W., 4,441,030, Cl. 290-53.000.

Seager, Richard H., to King-Seeley Thermos Co. Tray. 4,440,303, Cl. 206-509.000.

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Wessel, Kenneth R., 4,441,018, Cl. 235-458.000.

SED Systems Inc.: *See*—
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Sega Electronics, Inc.: *See*—
Fogelman, H. Frank; and Ambrose, Arnum, 4,440,457, Cl. 312-7.200.

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Girard, Maurice V.; Worrall, Michael J.; and Seguy, Bernard R., 4,440,549, Cl. 55-59.000.

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Inoue, Hiroshi; Isoi, Masaaki; and Sei, Kazuo, 4,440,911, Cl. 525-301.000.

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Hoda, Takeo; Oyokota, Shigeru; Seigenji, Kiyoshi; and Taniguchi, Nobuyuki, 4,440,481, Cl. 354-171.000.

Seki, Masao, to Fuji Foods Industry Co., Ltd. Method for producing bread crumbs. 4,440,793, Cl. 426-549.000.

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Amano, Kazunori; Aizawa, Bunji; Ibe, Akio; and Sekikawa, Yoichi, 4,440,147, Cl. 126-201.000.

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Seleno, Frank M.: *See*—
Stevenson, David L.; and Seleno, Frank M., 4,440,116, Cl. 123-25.00J.

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Tong, Yit C.; Seligman, Peter M.; Clark, Graeme M.; Patrick, James F.; and Millar, John B., 4,441,202, Cl. 381-68.000.

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Ohorodnik, Alexander; Keuper, Hans W.; Semmler, Horst; Hardel, Joachim; Vierling, Hermann; and Willms, Robert, 4,440,925, Cl. 528-487.000.

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Serkland, Richard C.: *See*—
Cone, Steven S.; Jones, David E.; and Serkland, Richard C., 4,440,364, Cl. 244-129.600.

Servo Corporation of America: *See*—
Sanville, W. Woodward, 4,441,196, Cl. 377-9.000.

Seton Company: *See*—
Cioca, Gheorghe, 4,440,680, Cl. 260-123.700.

Setteducati, Mark: *See*—
Hyland, Joseph F.; Wetherell, Joseph J.; and Setteducati, Mark, 4,440,395, Cl. 273-241.000.

Sewell, Richard B. H.; Yee, Lannie K.; and Chappell, Robert W., to Canada, Her Majesty the Queen in right of. Soda lime half life indicator. 4,440,162, Cl. 128-202.220.

Shaler, John E.: *See*—
Ricketts, Thomas E.; and Shaler, John E., 4,440,447, Cl. 299-2.000.

Shanfield, Stanley R.: *See*—
Little, Roger G.; and Shanfield, Stanley R., 4,440,108, Cl. 118-719.000.

Shanley, Robert L., II: *See*—
Harwood, Leopold A.; and Shanley, Robert L., II, 4,441,121, Cl. 358-36.000.

Shannon, Mark L.; and Mack, Mark P., to Conoco Inc. Olefin polymerization catalyst. 4,440,869, Cl. 502-104.000.

Shannon, Michael A., to Northern Telecom Limited. Control of diameter of fiber insulation on conductors. 4,440,596, Cl. 162-106.000.

Shapiro, Elliot L.; and Finkenor, Lawrence E., to Schering Corporation. Process for the synthesis of 6-bromo-17,21-dihydroxy 3,11,20-trioxo-1,4-pregnadienes 17,21-diesters. 4,440,690, Cl. 260-397.450.

Shapiro, Howard S., to ICI Americas inc. Hexahydropyrrolo[3,4-c]quinoline compounds and pharmaceutical compositions, and methods for their use. 4,440,768, Cl. 424-248.400.

Shapiro, Martin. Ankle supporter. 4,440,158, Cl. 128-80.00H.

Sharp Kabushiki Kaisha: *See*—
Hagihara, Hideaki, 4,440,280, Cl. 192-36.000.

Shaw, Hugh E., Jr., to PPG Industries, Inc. Apparatus for sensing a glass ribbon edge and method of use. 4,440,559, Cl. 65-99.500.

Shea, Edward T., to Reliable Automatic Sprinkler Company, Inc., The. Sprinkler. 4,440,234, Cl. 169-39.000.

Sheem, Sang K., to United States of America, Navy. Optical fiber gyroscope with (3×3) directional coupler. 4,440,498, Cl. 356-350.000.

Shell-O-Matic Inc.: *See*—
Muri, Georges, 4,440,806, Cl. 427-180.000.

Shell Oil Company: *See*—
Clark, Michael T.; and Gilmore, Ian J., 4,440,564, Cl. 71-90.000.
Kortbeek, Andras G. T. G.; Barre, Guy; and Durel, Jean M., 4,440,875, Cl. 518-728.000.

Shelton, William E. A.; and Corby, David C., to Alan Shelton Limited. Textile machine arrangement. 4,440,353, Cl. 242-47.010.

Shen, Tsung-Ying: *See*—
Doherty, James B.; Dorn, Conrad P.; Witzel, Bruce E.; Allison, Debra L.; and Shen, Tsung-Ying, 4,440,779, Cl. 424-274.000.

Shenk, Edwin K., to Polaroid Corporation. Sonic autofocus camera having variable sonic beamwidth. 4,440,482, Cl. 354-195.100.

Shepherd, Robert G., to American Cyanamid Company. Anti-atherosclerotic agents. 4,440,940, Cl. 560-19.000.

Sherritt Gordon Mines Limited: *See*—
Weir, Donald R.; and Master, Ian M., 4,440,569, Cl. 75-120.000.

Sherwood, Bob E.: *See*—
Benecke, Herman P.; and Sherwood, Bob E., 4,440,781, Cl. 424-285.000.

Sherwood Tool, Incorporated: *See*—
Johnson, Warren E.; and Maliszewski, Andrzej, 4,440,290, Cl. 198-479.000.

Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yosuke, to Nissan Motor Co., Ltd. Compliance steer control system. 4,440,254, Cl. 180-140.000.

Shibata, Jun; Yamada, Haruyasu; Mori, Toshiki; and Takemoto, Toyoki, to Matsushita Electric Industrial Co., Ltd. Shift register circuit. 4,441,198, Cl. 377-78.000.

Shigiya-Machinery Works Ltd.: *See*—
Urabe, Hirokuni, 4,441,103, Cl. 340-680.000.

Shiho, Masahiko; and Sato, Yasunori, to Fujitsu Limited. Plastic molding. 4,440,820, Cl. 428-120.000.

Shiihara, Takeo; Niihara, Toshihiro; Iwata, Hidemi; and Ishii, Noboru, to Toyo Kogyo Co. Ltd. Hydraulic control system for a rock drill. 4,440,236, Cl. 173-8.000.

Shimada, Yukio: *See*—
Tanino, Mikio; and Shimada, Yukio, 4,440,212, Cl. 165-12.000.

Shimamori, Toru; Hattori, Yoshinori; and Matsuo, Yasushi, to NGK Spark Plug Co., Ltd. Process for producing silicon nitride sintered products having high toughness. 4,440,707, Cl. 264-65.000.

Shimazaki, Hiroshi: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,440,643, Cl. 210-500.200.

Shimazu, Yuji: *See*—
Takaoka, Hidetugu; and Shimazu, Yuji, 4,441,048, Cl. 313-346.00R.

Shimizu, Tsuguo: *See*—
Matsuura, Tsuguo; Torii, Shunichi; and Shimizu, Tsuguo, 4,441,152, Cl. 364-200.000.

Shimokawa, Kenji: *See*—
Togari, Osamu; Matsuda, Masatoshi; Shimokawa, Kenji; and Makabe, Toshiji, 4,440,631, Cl. 208-112.000.

Shimotake, Hiroshi; and Bartholme, Louis G., to United States of America, Energy. Positive electrode current collector for liquid metal cells. 4,440,837, Cl. 429-112.000.

Shin Foa Koeki Kabushiki Kaisha: *See*—
Amano, Kazunori; Aizawa, Bunji; Ibe, Akio; and Sekikawa, Yoichi, 4,440,147, Cl. 126-201.000.

Shine, John: *See*—
Rutter, William J.; Goodman, Howard M.; Ullrich, Axel; Shine, John; Chirgwin, John; and Pictet, Raymond, 4,440,859, Cl. 435-172.000.

Shinozaki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Air cleaner apparatus for motorized two-wheeled vehicle. 4,440,255, Cl. 180-225.000.

Shionogi & Co., Ltd.: *See*—
Tsuji, Teruji; Hahashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,440,683, Cl. 260-239.00A.

Shishido, Yoshio, to Olympus Optical Co., Ltd. Hard endoscope. 4,440,157, Cl. 128-6.000.

Shoemaker, Dwight E., Jr. Drafting instrument. 4,439,928, Cl. 33-494.000.

Shopsmith, Inc.: *See*—
Bartlett, Robert L., 4,440,204, Cl. 144-130.000.

Shuman, Curtis A., to Magnetic Peripherals Inc. Partial beam focus sensing in an optical recording system. 4,441,175, Cl. 369-45.000.

Shure Brothers, Inc.: *See*—
Groh, Allen R.; and Kehl, Joseph D., 4,441,177, Cl. 369-170.000.

Sickles, James E.; and Anestos, Themistocles C., to PPG Industries, Inc. Electrostatic spray gun having increased surface area from which fluid particles can be formed. 4,440,349, Cl. 239-698.000.

Siegfried Aktiengesellschaft: *See—*
Meyer, Jacques; and Scharen, Walter E., 4,440,561, Cl. 71-70.000.

Siegl, Ludwig R.: *See—*
Dodgen, David F.; and Siegl, Ludwig R., 4,441,077, Cl. 324-164.000.

Siemens AG: *See—*
Bayer, Karl-Heinz; and Blaschke, Felix, 4,441,065, Cl. 318-808.000.
Pammer, Erich, 4,440,883, Cl. 523-402.000.

Siemens Aktiengesellschaft: *See—*
Auracher, Franz; and Stockmann, Michael, 4,440,468, Cl. 350-96.120.
Hoffmann, Kurt, 4,441,171, Cl. 365-205.000.
Jungmeister, Hans G., 4,441,185, Cl. 371-56.000.
Oldham, William G., 4,441,036, Cl. 307-242.000.
Winzer, Gerhard; Mahlein, Hans; and Reichelt, Achim, 4,441,181, Cl. 370-3.000.

Siemens Aktiengesellschaft GmbH: *See—*
Mundel, Gerald; and Lenz, Michael, 4,441,040, Cl. 307-491.000.

Siemon Company, The: *See—*
Phol, Karl-Heinz, 4,440,466, Cl. 339-97.00P.

Sigg, Max, to Mettler Instrumente AG. Weighing scale having a hydraulic damper intercoupled between the load receiver and the measuring cell. 4,440,250, Cl. 177-187.000.

Siglock, John V., to Unicorn Electrical Products. High pressure sodium lamp ballast circuit. 4,441,056, Cl. 315-290.000.

Signet Scientific Co.: *See—*
Pounder, Edwin; Arena, Alan J.; Pawlowski, Michael; and Totten, Adrian M., 4,440,030, Cl. 73-861.870.

Silchor: *See—*
Houle, Raymond T., 4,439,877, Cl. 4-596.000.

Silfvast, William T.: *See—*
Macklin, John J.; Silfvast, William T.; and Wood, Obert R., II, 4,441,189, Cl. 372-76.000.

Silver Industries: *See—*
Van Buskirk, E. James; and Ennis, James, 4,440,306, Cl. 215-230.000.

Simmons U.S.A. Corporation: *See—*
Stumpf, Walter, 4,439,977, Cl. 53-428.000.

Simonds, Gary, to Kidde Recreation Products, Inc. Compound bow cable tension adjuster. 4,440,142, Cl. 124-23.00R.

Simplex Ceiling Corp.: *See—*
Nassof, Martin, 4,439,973, Cl. 52-714.000.

Simplimatic Engineering Co.: *See—*
Wiseman, John A., 4,439,974, Cl. 53-248.000.

Sinclair & Powell Proprietary Limited: *See—*
Powell, George G.; and Powell, Reece J., 4,440,461, Cl. 312-330.00R.

Sirtori, Cesare: *See—*
Scolastico, Carlo; Sirtori, Cesare; and Kritchevsky, David, 4,440,688, Cl. 260-397.100.

SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Herrmann, Gerhard; and Bauer, Bernhard, 4,440,401, Cl. 277-50.000.

Skinner, Dean W.: *See—*
Dayger, Douglas A.; Hryck, Michael D.; Skinner, Dean W.; and Westcott, Gerald R., 4,440,079, Cl. 101-93.030.

Skurski, James K. Film saving apparatus for photographic camera. 4,440,480, Cl. 354-110.000.

Slaten, Gary G., to Discovision Associates. Optical video disc structure. 4,441,179, Cl. 369-275.000.

Slobodnik, Lev. Auto flow system. 4,440,315, Cl. 222-56.000.

Slurry Mining Engineering Inc.: *See—*
Coakley, John E., 4,440,450, Cl. 299-17.000.

Smagner, John D. Trap insert. 4,439,947, Cl. 43-96.000.

Small, Eric: *See—*
Chester, John K.; Small, Eric; and Stoll, Eric D., 4,441,199, Cl. 381-14.000.

Smerecnik, Antoon F.: *See—*
Kaanders, Johannes M. G. M.; van Rijsewijk, Cornelis H. M.; and Smerecnik, Antoon F., 4,440,982, Cl. 179-107.00R.

Smid, Albert; and Haisma, Jan, to U.S. Philips Corporation. Method and device for moulding a transparent object. 4,440,699, Cl. 264-1.400.

Smit, Edward H.; and Sukup, Eugene G., to Sukup Manufacturing Co. Rotary grain screeners. 4,440,637, Cl. 209-241.000.

Smith, Allan J., Jr. Tennis net support post. 4,440,393, Cl. 273-29.0BB.

Smith, Arthur W., to Stanadyne, Inc. Diesel engine fuel system. 4,440,138, Cl. 123-557.000.

Smith, Brian J.: *See—*
Collins, Ronald B.; Dowzall, Martin E.; Smith, Brian J.; and Taylor, Geoffrey R., 4,440,590, Cl. 156-234.000.

Smith, David A. Amusement game. 4,440,399, Cl. 273-346.000.

Smith, David W.: *See—*
Ames, Jack D.; and Smith, David W., 4,440,389, Cl. 271-251.000.

Smith, Eric L. Dental flossing device. 4,440,184, Cl. 132-91.000.

Smith, James F., to Kollmorgen Technologies Corporation. Bipolar linear current source driver amplifier for switching loads. 4,441,068, Cl. 323-351.000.

Smith, Jerry R., to Innovative Research Corporation. Rekeyable lock method and apparatus. 4,440,009, Cl. 70-385.000.

Smith, Kenneth V.: *See—*
Taylor, Jack D.; and Smith, Kenneth V., 4,440,891, Cl. 524-177.000.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,440,775, Cl. 424-269.000.

Smith, Noel A.; and Avallone, William J., to Saran Protective Coating Company. Protective coating composition and method of use therefor. 4,440,582, Cl. 148-6.15R.

Smith, Richard D.: *See—*
Thomas, William M.; and Smith, Richard D., 4,440,288, Cl. 198-425.000.

Smith, Robert D., to Scandpower, Inc. In-situ calibration of local power measuring devices for nuclear reactors. 4,440,716, Cl. 376-247.000.

Smith, Samuel D. Attachment to a ladder. 4,440,263, Cl. 182-121.000.

SmithKline Beckman Corporation: *See—*
Gleason, John G.; Kinzig, Charles M.; and Bryan, Deborah L., 4,440,939, Cl. 549-548.000.

Smiths Industries Public Limited Company: *See—*
Masom, Ronald A., 4,440,022, Cl. 73-293.000.

SMK Electronics Corporation, USA: *See—*
Nozaki, Satoru, 4,440,990, Cl. 200-5.00A.

SMS Schloemann-Siemag AG: *See—*
Feldmann, Hugo; Hollmann, Friedrich; Beisemann, Gerd; and Gartner, Horst, 4,440,012, Cl. 72-201.000.

Snap-on Tools Corporation: *See—*
Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; and Becker, Thomas P., 4,441,021, Cl. 250-227.000.

SNIA VISCOSA S.p.A. Societa Nazionale Industria Applicaziono Viscosa: *See—*
Mazzola, Massimo; and Cipriani, Aldo, 4,440,876, Cl. 521-123.000.

Snitgen, Joseph D. Hydraulic power unit. 4,439,986, Cl. 60-547.100.

Sobolewski, George, to Urban Transportation Development Corporation Ltd. Railway steering truck linear induction motor assembly. 4,440,092, Cl. 104-291.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Lunder, Tito-Livio; and Nielsen, Corine-Madeleine, 4,440,796, Cl. 426-597.000.

Societe Les Piles Wonder: *See—*
Vignaud, Rene, 4,440,835, Cl. 429-42.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, S.N.E.C.M.A.: *See—*
Aubert, Jean-Pierre P. A.; and Tirole, Jacques P. H., 4,440,834, Cl. 428-554.000.

Sodick Co., Ltd.: *See—*
Furukawa, Toshihiko, 4,441,005, Cl. 219-69.00C.

Sokolovsky, Mordechai: *See—*
Golstein, Leon; Sokolovsky, Mordechai; and Freeman, Amihay, 4,440,903, Cl. 525-54.100.

Solartron Electronic Group Limited, The: *See—*
Bockett-Pugh, Charles P.; and Kett, Brian L., 4,441,074, Cl. 324-73.00R.

Solmat Systems Ltd.: *See—*
Assaf, Gad, 4,440,148, Cl. 126-415.000.

Solomon, Frank, to Diamond Shamrock Corporation. Non-bleeding electrode. 4,440,617, Cl. 204-290.00R.

Son, Adelina J.: *See—*
Loftin, Royal E.; and Son, Adelina J., 4,440,649, Cl. 252-8.50C.

Sone, Kohki: *See—*
Kitahara, Tsuyoshi; Uchida, Masaaki; and Sone, Kohki, 4,440,621, Cl. 204-406.000.

Sonoda, Takenori; Watanabe, Nobuhiko; and Tanaka, Masato, to Sony Corporation. Method and apparatus for transmitting a digital signal. 4,441,184, Cl. 371-40.000.

Sony Corporation: *See—*
Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, 4,441,083, Cl. 330-149.000.
Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, 4,441,084, Cl. 330-149.000.
Ohba, Takeo; and Koga, Hirohisa, 4,441,128, Cl. 360-75.000.
Sonoda, Takenori; Watanabe, Nobuhiko; and Tanaka, Masato, 4,441,184, Cl. 371-40.000.

Sorenson, John R. J. Anti-inflammatory and anti-ulcer compounds and process. 4,440,754, Cl. 424-140.000.

Sorenson, Richard W., to Carlingswitch, Inc. Electric switch with nested terminals. 4,440,991, Cl. 200-6.00R.

Sorlien, Mark D., to Minnesota Mining and Manufacturing Company. Flexible strip heater. 4,441,017, Cl. 219-528.000.

Spagnoli, Giulio, to Alitalia Linee Aeree Italiane S.p.A. Hydropneumatic positioner for removal/or installation of wing engines of aircrafts and the like. 4,440,265, Cl. 182-129.000.

Sparton Corporation: *See—*
Neese, James A., 4,441,099, Cl. 340-388.000.

Spaulding, Lawrence D.: *See—*
Holtzberg, Matthew W.; Henke, Steven J.; Spaulding, Lawrence D.; and Oakley, James C., 4,440,069, Cl. 92-224.000.

Spaw, William J.: *See—*
Folmsbee, Alan C.; Kokkonen, Kim; and Spaw, William J., 4,441,170, Cl. 365-200.000.

Spectrum Medical Industries, Inc.: *See—*
Eddleman, Roy T., 4,439,901, Cl. 24-248.00B.

Spencer, Alwyn: *See—*
Bellus, Daniel; Blaser, Hans-Ulrich; Kabas, Guglielmo; Reinehr, Dieter; Spencer, Alwyn; and Weber, Kurt, 4,440,694, Cl. 260-465.00D.

Spencer, Billie M.: *See*—
Kingston, Samuel C.; Spencer, Billie M.; Zscheile, John W., Jr.; and Price, Robert, 4,441,194, Cl. 375-96.000.
Spencer, Edward M.: *See*—
McConnell, Lorne D.; and Spencer, Edward M., 4,440,998, Cl. 200-148.00R.
Spergel, Gabriel. Emergency escape breathing apparatus. 4,440,163, Cl. 128-205.130.
Sperner, Franz: *See*—
Bussard, Adrien; Aldinger, Fritz; and Sperner, Franz, 4,440,178, Cl. 128-784.000.
Sperry Corporation: *See*—
Greenig, Nelson L.; Taylor, John R.; and Schwartz, Richard S., 4,441,126, Cl. 358-293.000.
Kingston, Samuel C.; Spencer, Billie M.; Zscheile, John W., Jr.; and Price, Robert, 4,441,194, Cl. 375-96.000.
Luciw, Wolodymyr, 4,441,168, Cl. 365-154.000.
Spinner, Georg. Coaxial HF plug connector having alternate connecting means. 4,440,464, Cl. 339-33.000.
Spire Corporation: *See*—
Little, Roger G.; and Shanfield, Stanley R., 4,440,108, Cl. 118-719.000.
Spongr, Jerry J.: *See*—
Joffe, Boris B.; Spongr, Jerry J.; and Sawyer, Byron E., 4,441,022, Cl. 250-308.000.
Sprengers, Leo M., to U.S. Philips Corporation. Low-pressure sodium vapor discharge lamp. 4,441,045, Cl. 313-25.000.
Square D Company: *See*—
Roof, Richard W.; and Berton, Kenneth S., 4,441,063, Cl. 318-722.000.
Srinivasan, Rangaswamy: *See*—
Aviram, Ari; Mayne-Banton, Veronica I.; and Srinivasan, Rangaswamy, 4,440,801, Cl. 427-54.100.
Stach, Leonard J., to Velsicol Chemical Corporation. Composition of matter. 4,440,567, Cl. 71-105.000.
Staggers, John O.; Banerji, Samir K.; and Lalich, Michael J., to Foote Mineral Company. Boron alloying additive for continuously casting boron steel. 4,440,568, Cl. 75-53.000.
Stamicarbon B.V.: *See*—
Peerlkamp, Erik R., 4,440,899, Cl. 524-528.000.
Stamper, James F.: *See*—
Knoke, Silas J.; and Stamper, James F., 4,440,264, Cl. 182-126.000.
Stanadyne, Inc.: *See*—
Smith, Arthur W., 4,440,138, Cl. 123-557.000.
Standard Oil Company: *See*—
Weisrock, William P., 4,440,651, Cl. 252-8.55D.
Standard Oil Company (Indiana): *See*—
Vasalos, Iacovos A.; and Wollaston, Eugene G., 4,440,632, Cl. 208-113.000.
Standard Oil Corporation (Indiana): *See*—
Holtzberg, Matthew W.; Henke, Steven J.; Spaulding, Lawrence D.; and Oakley, James C., 4,440,069, Cl. 92-224.000.
Stang, John H.; and Cusick, Steven M., to Cummins Engine Company, Inc. Oil cooled internal combustion engine. 4,440,118, Cl. 123-41.840.
Stanwood, Phillip C.: *See*—
Leflar, James A.; and Stanwood, Phillip C., 4,440,152, Cl. 126-435.000.
Starai, Rudolph: *See*—
Mischenko, Nicholas; Parker, Robert R.; and Starai, Rudolph, 4,440,478, Cl. 353-25.000.
Stark, Bernard P.: *See*—
Paul, John G.; Stark, Bernard P.; and Losert, Ewald, 4,440,850, Cl. 430-325.000.
Starr, John B., Jr.: *See*—
Fox, Daniel W.; Kaduk, Bruce A.; and Starr, John B., Jr., 4,440,912, Cl. 525-439.000.
Staufer, Adolf, to TRAK Sportartikel GmbH. Ski base coating. 4,440,418, Cl. 280-604.000.
Stauffer Chemical Company: *See*—
Robbins, Jeffrey D., 4,440,695, Cl. 260-502.50F.
Scher, Herbert B., 4,440,563, Cl. 71-88.000.
Stazhevsky, Stanislav B.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.
Stearns, Charles F.: *See*—
Donnelly, Brian G.; and Stearns, Charles F., 4,440,192, Cl. 137-501.000.
Stearns, Llewelyn B. Method and apparatus of chemical milling of chemical materials. 4,440,594, Cl. 156-664.000.
Steeger, Gerhard; and Plischke, Josef, to Patent-Treuhand-Gesellschaft Fur elektrische Gluhlampen mbH. Single-ended low pressure discharge lamp and method of manufacture. 4,441,050, Cl. 313-493.000.
Stehlik, Miroslva J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Timing method for machine gun. 4,440,064, Cl. 89-136.000.
Stein, Alexander, to Exxon Research and Engineering Co. Pyrometric gas temperature measurement system. 4,440,510, Cl. 374-169.000.
Steinecke, Rudolf; and Hensche, Karl-Heinz, to Daimler-Benz AG. Truck cab hydraulic tilting mechanism. 4,440,252, Cl. 180-89.150.
Stelco Inc.: *See*—
Muzak, Nicholas, 4,439,991, Cl. 62-63.000.
Stephan, Bernhard: *See*—
Koppers, Manfred; Bohnes, Karlheinz; and Stephan, Bernhard, 4,440,526, Cl. 405-260.000.
Stern, Jonathan J.: *See*—
Downing, Harry M., 4,440,783, Cl. 424-302.000.
Stevens, John E., to Leggett & Platt, Incorporated. Sofa sleeper with seat adjustment mechanism. 4,439,878, Cl. 5-29.000.
Stevens, Larry G. H.; Sweet, Edmund G. F.; and Vresk, Franklin V., to MIC Manufacturing and Machine Works Ltd. Fastener driving device with multiple bits. 4,440,048, Cl. 81-440.000.
Stevenson, Christopher T. S., to Litton Industrial Products, Inc. Friction welding machine. 4,440,338, Cl. 228-2.000.
Stevenson, David L.; and Seleno, Frank M., to Schmelzer Corporation. Coolant injector. 4,440,116, Cl. 123-25.00J.
Stevenson, Edward J.; and Dean, Donald E. Hot air welder for welding roofing material. 4,440,588, Cl. 156-157.000.
Stewart Engineering and Equipment Co.: *See*—
Thomas, William M.; and Smith, Richard D., 4,440,288, Cl. 198-425.000.
Stewart, John M.; and Hewson, Clifford B., to Sanitation Equipment Limited. Toilet. 4,439,875, Cl. 4-321.000.
Stieler, Scott M. Counterflow heat exchanger. 4,440,217, Cl. 165-155.000.
Stine, Laurence O., to UOP Inc. Hydrocarbon hydrocracking process. 4,440,629, Cl. 208-111.000.
Stocker, Herbert: *See*—
Felger, Gunter; Glockler, Otto; Kauff, Helmut; Kiencke, Uwe; Knapp, Heinrich; and Stocker, Herbert, 4,440,131, Cl. 123-440.000.
Stockmann, Michael: *See*—
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Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co.: *See*—
Heinz, Manigel; and Hermann, Stroter, 4,439,906, Cl. 29-412.000.
Stoll, Eric D.: *See*—
Chester, John K.; Small, Eric; and Stoll, Eric D., 4,441,199, Cl. 381-14.000.
Stoll, Hans-Wolfgang: *See*—
Klie, Jurgen; and Stoll, Hans-Wolfgang, 4,440,067, Cl. 91-491.000.
Stone Container Corporation: *See*—
Konopko, Matthew S., 4,440,304, Cl. 206-586.000.
Stone, Julian, to Bell Telephone Laboratories, Incorporated. Dye lasers. 4,441,188, Cl. 372-54.000.
Stork PMT B.V.: *See*—
van Mil, Martinus P. G., 4,439,891, Cl. 17-11.000.
Stormont, Richard W.; and Eriss, Lawrence, to Mobil Solar Energy Corporation. Apparatus for growing tubular crystalline bodies. 4,440,728, Cl. 422-246.000.
Stout, Christopher B.: *See*—
Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; and Becker, Thomas P., 4,441,021, Cl. 250-227.000.
Straehle, Wolfgang: *See*—
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Strasilla, Dieter; Meindl, Hubert; Moldovanyi, Laszlo; and Fearnley, Charles, to Ciba-Geigy Corporation. Quaternary, copolymeric, high molecular weight ammonium salts based on acrylic compounds, and their use in cosmetics. 4,440,744, Cl. 424-70.000.
Striegler, Hellmut: *See*—
Heins, Ferdinand; Matner, Martin; and Striegler, Hellmut, 4,440,895, Cl. 524-822.000.
Strohbeen, John. Loudspeaker system for producing coherent sound. 4,440,259, Cl. 181-146.000.
Strong, Barry C.; and Brain, Herbert, to William Cotton Limited. Variable draw mechanism for straight bar knitting machines. 4,440,002, Cl. 66-126.00R.
Struck, Carl-Heinz; Schumacher, Ralf; and Thubeauville, Heinz, to Dr. C. Otto & Comp. G.m.b.H. Heating system for a coke oven battery having twin-heating flues. 4,440,599, Cl. 202-141.000.
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Stultz, William H.: *See*—
Trickel, Lorn L.; and Stultz, William H., 4,440,208, Cl. 152-314.000.
Stumpf, Walter, to Simmons U.S.A. Corporation. Method and apparatus for making a series of pocketed coil springs. 4,439,977, Cl. 53-428.000.
Sugitani, Yuji: *See*—
Nomura, Hirokazu; and Sugitani, Yuji, 4,441,011, Cl. 219-124.340.
Sugiura, Shinji; Fujii, Yasuhiro; Sato, Katsunori; Nezu, Tuguo; and Okumura, Yasumasa, to Kansai Paint Co., Ltd. Coating composition for pliable substrates. 4,440,913, Cl. 525-443.000.
Suglia, Jean-Claude: *See*—
Herve, Jean-Jacques; Suglia, Jean-Claude; and Meinard, Colette, 4,440,756, Cl. 424-174.000.
Suh, John T.; Menard, Paul R.; and Jones, Howard, to USV Pharmaceutical Corporation. Aroyl-aminoacids, amides and esters thereof. 4,440,941, Cl. 560-20.000.
Sukup, Eugene G.: *See*—
Smit, Edward H.; and Sukup, Eugene G., 4,440,637, Cl. 209-241.000.
Sukup Manufacturing Co.: *See*—
Smit, Edward H.; and Sukup, Eugene G., 4,440,637, Cl. 209-241.000.
Sullivan, Michael P. Flow control apparatus. 4,440,378, Cl. 251-117.000.

Sullivan, Thomas J. Method and apparatus for conveying particulate matter. 4,440,539, Cl. 414-300.000.
Suman, George O., Jr. Well completion method. 4,440,226, Cl. 166-250.000.
Sumida, Isao: *See—*
Yamamoto, Takanobu; Sumida, Isao; Tsukamoto, Moriaki; Imani, Kazutake; and Watahiki, Naohisa, 4,440,151, Cl. 126-433.000.
Summerville, James E., Jr., administrator: *See—*
Summerville, Richard H., deceased; and Summerville, James E., Jr., administrator, 4,440,946, Cl. 560-210.000.
Summerville, Richard H., deceased; and Summerville, James E., Jr., administrator, to Celanese Corporation. Production of esters from aldehydes using a silver/cadmium/zinc/zirconium catalyst. 4,440,946, Cl. 560-210.000.
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Bocci, Paul M.; Sumner, Terence E.; and Wojnarowski, James R., 4,440,976, Cl. 179-1.50R.
Suslov, Valentin A.: *See—*
Albertinsky, Boris I.; Dmitrieva, Nina M.; Evseev, Anatoly K.; Zotov, Ivan P.; Ivanov, Andrei S.; Sviniin, Mikhail P.; Suslov, Valentin A.; and Fedotov, Mikhail T., 4,441,150, Cl. 363-126.000.
Susnjara, Kenneth J., to RCA Corporation. Method and apparatus for making thin-walled plastic articles. 4,440,702, Cl. 264-37.000.
Sutko, John L.: *See—*
Judy, Millard M.; and Sutko, John L., 4,440,638, Cl. 210-198.200.
Suwa, Kaname, to Canon Kabushiki Kaisha. Slide switch mechanism. 4,441,000, Cl. 200-291.000.
Suyama, Tsuneo: *See—*
Kanazawa, Tatsuo; and Suyama, Tsuneo, 4,440,300, Cl. 206-446.000.
Suzuki, Hajime; Suzuki; and Arakawa, Hiroshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Apparatus for guiding weft yarns in a jet loom. 4,440,198, Cl. 139-435.000.
Suzuki, Hiroaki: *See—*
Sasaki, Itsuo; and Suzuki, Hiroaki, 4,441,169, Cl. 365-190.000.
Suzuki, Toshiyuki; and Nakamura, Kazuo, to Anelva Corporation. Gas discharge device comprising a pressure controller for controlling a pressure over a wide range. 4,440,618, Cl. 204-298.000.
Suzuki, Yasuo: *See—*
Mochida, Ei; Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Kosuzume, Hiroshi, 4,440,770, Cl. 424-258.000.
Suzuki, Yoshitsugu; Iizuka, Syogo; Kajiyama, Shigeo; Usui, Kenji; and Kobayashi, Masahiro, to Yazaki Corp. Wire-laying head. 4,440,053, Cl. 83-282.000.
Svendsen, Lars G., to Pentapharm, A.G. Tripeptide derivatives and their application in assaying enzymes. 4,440,678, Cl. 260-112.50R.
Sviniin, Mikhail P.: *See—*
Albertinsky, Boris I.; Dmitrieva, Nina M.; Evseev, Anatoly K.; Zotov, Ivan P.; Ivanov, Andrei S.; Sviniin, Mikhail P.; Suslov, Valentin A.; and Fedotov, Mikhail T., 4,441,150, Cl. 363-126.000.
Swanson, Billy L., to Phillips Petroleum Company. Gelled compositions and well treating. 4,440,228, Cl. 166-274.000.
Swart, Louis M., to U.S. Philips Corporation. Beam current control for television camera. 4,441,122, Cl. 358-41.000.
Sweeney, William A., to Chevron Research Company. Molding pillars in underground mining of oil shale. 4,440,449, Cl. 299-11.000.
Sweeney, William A., to Chevron Research Company. Purification of olefins by boron trifluoride-alcohol treatment. 4,440,969, Cl. 585-851.000.
Sweet, Edmund G. F.: *See—*
Stevens, Larry G. H.; Sweet, Edmund G. F.; and Vręsk, Franklin V., 4,440,048, Cl. 81-440.000.
Swesey, Calvin M.: *See—*
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Swindell, Harold J.; and Thompson, Randall G., to Phillips Petroleum Company. Regenerator temperature control. 4,440,725, Cl. 422-62.000.
Szabo, George S. A. Convertible seats for transport. 4,440,439, Cl. 297-62.000.
Szirmai, Stephen G.: *See—*
Morton, David H.; Szirmai, Stephen G.; and Potter, Edmund C., 4,440,800, Cl. 427-13.000.
Tabb, David L.; and Burrows, Janine P., to Helena Laboratories Corporation. Composition for detecting ketone bodies and method of preparation. 4,440,724, Cl. 422-56.600.
Tabuchi, Kazuhiro, to Dai Nippon Insatsu Kabushiki Kaisha. Photomask and photomask blank. 4,440,841, Cl. 430-5.000.
Tachita, Ryobun: *See—*
Hayakawa, Yoshihiro; Yano, Tsutomu; Tachita, Ryobun; Fukukita, Hiroshi; Irioka, Kazuyoshi; and Fukumoto, Akira, 4,440,025, Cl. 73-642.000.
Tady Corporation: *See—*
Heep, Jerry J.; and Schreiber, Paul, 4,440,987, Cl. 179-2.0DP.
Taguchi, Yasuo; and Nakao, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Ignition control device. 4,440,130, Cl. 123-427.000.
Takacs, Ferenc: *See—*
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; Muller, Henrik; Nyiro, Katalin; and Takacs, Ferenc, 4,440,619, Cl. 204-401.000.
Takahama, Sho, to Konan Camera Research Institute. Photographic transparency supporting device. 4,440,491, Cl. 355-75.000.
Takahashi, Hiroshi: *See—*
Tomikawa, Kouichi; and Takahashi, Hiroshi, 4,440,499, Cl. 366-3.000.
Takahashi, Masayoshi: *See—*
Nomoto, Reishi; Takahashi, Masayoshi; and Ebata, Yoshikazu, 4,440,171, Cl. 128-335.500.
Takanashi, Akihiro: *See—*
Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Hosaka, Sumio; Kawamura, Yoshio; and Terasawa, Tsuneo, 4,441,206, Cl. 382-08.000.
Takao, Hiroshi: *See—*
Ikezawa, Kenji; Takao, Hiroshi; Ambe, Satoshi; and Uchida, Masaaki, 4,439,911, Cl. 29-570.000.
Takaoka, Hidetugu; and Shimazu, Yuji, to Hamamatsu TV Co., Ltd. Cathode for a gas discharge tube. 4,441,048, Cl. 313-346.00R.
Takashima, Hiroaki: *See—*
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,440,624, Cl. 208-22.000.
Takeda Chemical Industries, Ltd.: *See—*
Kuzuna, Seiji; Kishimoto, Shoji; and Aono, Tetsuya, 4,440,691, Cl. 260-429.900.
Takeda, Tsuneshi; Otsuji, Kazuya; Tamura, Junichi; Morii, Yoshikazu; Higashiwaki, Michio; and Nakatani, Yoshitaka, to Kao Soap Co., Ltd. Hollow granular percarbonate. 4,440,732, Cl. 423-415.00P.
Takehisa, Shigeru, to Kabushikikaisha Yoshida. Anesthetizer for dental treatment. 4,440,167, Cl. 128-303.100.
Takemoto, Toyoki: *See—*
Shibata, Jun; Yamada, Haruyasu; Mori, Toshiki; and Takemoto, Toyoki, 4,441,198, Cl. 377-78.000.
Takeshige, Kenji; Hirabe, Kenji; Ogawa, Yukifumi; Arikata, Kazuyoshi; Yako, Kazunori; Sakai, Kenichi; Matsuo, Toshinori; and Kamio, Hiroshi, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for cooling steel sheet. 4,440,584, Cl. 148-128.000.
Takeshima, Kiyoshi; and Hasegawa, Akira, to Yoshida Kogyo K.K. Slide fastener stringer. 4,439,898, Cl. 24-401.000.
Takeuchi, Hirosato; and Mikiya, Toshio, to Nitto Kohki Co., Ltd. Solar heat collector. 4,440,156, Cl. 126-443.000.
Takeuchi, Shoji; Nishiyama, Kozaburo; and Gomi, Tadashi, to Fuji Kasei Co., Ltd.; and Yuho Chemicals Inc. Powdered cleaning composition. 4,440,661, Cl. 252-89.100.
Takino, Shigekatzu: *See—*
Murai, Masasumi; Kondo, Hirokazu; and Takino, Shigekatzu, 4,440,090, Cl. 104-127.000.
Tamai, Yasumasa; and Koyama, Takaichi, to Hitachi, Ltd. Method of repairing housing of control rod driving system. 4,440,339, Cl. 228-119.000.
Tamosauskas, Albert E., to PPG Industries, Inc. Peroxide emulsions and sizing composition containing same. 4,440,885, Cl. 524-57.000.
Tamura, Junichi: *See—*
Takeda, Tsuneshi; Otsuji, Kazuya; Tamura, Junichi; Morii, Yoshikazu; Higashiwaki, Michio; and Nakatani, Yoshitaka, 4,440,732, Cl. 423-415.00P.
Tanaka, Hiroaki: *See—*
Tomiyasu, Hiroshi; and Tanaka, Hiroaki, 4,440,029, Cl. 73-861.730.
Tanaka, Junichi: *See—*
Ishikawa, Toshikatsu; Tanaka, Junichi; Teranishi, Haruo; Okamura, Tatsuya; and Hayase, Tokuji, 4,440,571, Cl. 75-229.000.
Tanaka, Kunihiko: *See—*
Kamiya, Takashi; Tanaka, Kunihiko; Nakai, Yoshiharu; and Sakane, Kazuo, 4,440,766, Cl. 424-246.000.
Tanaka, Masaaki: *See—*
Kawagoe, Michio; and Tanaka, Masaaki, 4,440,140, Cl. 123-571.000.
Tanaka, Masamichi; and Wada, Hiroto, to Tokyo Shibaura Denki Kabushiki Kaisha. Electret device. 4,441,038, Cl. 307-400.000.
Tanaka, Masato: *See—*
Sonoda, Takenori; Watanabe, Nobuhiko; and Tanaka, Masato, 4,441,184, Cl. 371-40.000.
Tanaka, Shoichi: *See—*
Ishibashi, Junya; Miyazaki, Shigeru; and Tanaka, Shoichi, 4,440,511, Cl. 384-278.000.
Tanaka, Tsutomu: *See—*
Matsui, Ichiro; Tanaka, Tsutomu; Bando, Yukio; and Ohashi, Kiyonobu, 4,440,778, Cl. 424-274.000.
Tani, Haruhisa: *See—*
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,440,700, Cl. 264-8.000.
Tanida, Hiroshi: *See—*
Tsuji, Teruji; Hahashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,440,683, Cl. 260-239.00A.
Taniguchi, Nobuyuki: *See—*
Hoda, Takeo; Oyokota, Shigeru; Seigenji, Kiyoshi; and Taniguchi, Nobuyuki, 4,440,481, Cl. 354-171.000.
Tanino, Mikio; and Shimada, Yukio, to Nissan Motor Company, Limited. Air-conditioner for an automotive vehicle. 4,440,212, Cl. 165-12.000.
Tanioka, Susumu: *See—*
Ihara, Keisuke; Hoshino, Shozi; and Tanioka, Susumu, 4,440,074, Cl. 99-510.000.
Tapio, Olli: *See—*
Koski, Erkki; and Tapio, Olli, 4,440,598, Cl. 162-305.000.
Tappe, Horst; Lowenfeld, Rudolf; Kosubek, Uwe; and Kallay, Maria, to Cassella Aktiengesellschaft. Water-insoluble monoazo dyestuffs and their preparation. 4,440,681, Cl. 260-207.100.
Tappehorn, Bernd: *See—*
Keiter, Alfred; Mudder, Wolfgang; and Tappehorn, Bernd, 4,440,514, Cl. 400-208.000.

Taylor, Donald F.; and Boyle, William G., to Otis Engineering Corporation. Submergible pump installation. 4,440,221, Cl. 166-106.000.

Taylor, Geoffrey R.: *See*—
Collins, Ronald B.; Dowzall, Martin E.; Smith, Brian J.; and Taylor, Geoffrey R., 4,440,590, Cl. 156-234.000.

Taylor, Jack D.; and Smith, Kenneth V., to Carstab Corporation. Halogen-containing polymers stabilized with organic antimony compound and an ortho mercapto phenol compound. 4,440,891, Cl. 524-177.000.

Taylor, John R.: *See*—
Greenig, Nelson L.; Taylor, John R.; and Schwartz, Richard S., 4,441,126, Cl. 358-293.000.

Taylor, Michael J., to Rogers Corporation. Miniaturized bus bar with capacitors and method of making same. 4,440,972, Cl. 174-72.00B.

Teich, Wesley W.; Freedman, George; and Adamski, Joseph R., to Raytheon Company. Cook-by-weight microwave oven. 4,441,002, Cl. 219-10.55B.

Teknor Apex Company: *See*—
Buchan, Walter; Cardin, Paul P.; and Fain, Norman M., 4,440,818, Cl. 428-99.000.

Teledyne Industries, Inc.: *See*—
Barbeau, Dennis E., 4,441,156, Cl. 364-431.020.

Telematic Products, Inc.: *See*—
Barnett, Mark L.; and Owens, John C., 4,440,978, Cl. 179-5.500.

Ten Pas, Jan L., to U.S. Philips Corporation. Omnidirectional multiple-band antenna. 4,441,108, Cl. 343-857.000.

Terada, Katsuyuki: *See*—
Kakehi, Yutaka; Terada, Katsuyuki; Kasai, Kenjiro; and Iwasaki, Fumio, 4,440,093, Cl. 105-164.000.

Terada, Tomohiko; and Komada, Hideaki, to Diesel Kiki Company, Ltd. Fuel injection system. 4,440,132, Cl. 123-446.000.

Teranishi, Haruo: *See*—
Ishikawa, Toshikatsu; Tanaka, Junichi; Teranishi, Haruo; Okamura, Tatsuya; and Hayase, Tokuji, 4,440,571, Cl. 75-229.000.

Teraoka, Kazuharu, to Teraoka Seikosho Co., Ltd. Bar code printer. 4,440,248, Cl. 177-4.000.

Teraoka Seikosho Co., Ltd.: *See*—
Teraoka, Kazuharu, 4,440,248, Cl. 177-4.000.

Terasawa, Tsuneo: *See*—
Kuniyoshi, Shinji; Takanashi, Akihiro; Kurosaki, Toshiei; Hosaka, Sumio; Kawamura, Yoshio; and Terasawa, Tsuneo, 4,441,206, Cl. 382-08.000.

Terayama, Hiroshi; Morita, Yoshiharu; and Umezu, Kohei, to Mitsubishi Chemical Industries, Limited. Cysteine derivatives. 4,440,788, Cl. 424-320.000.

Terayama, Takao: *See*—
Ogawa, Tsuneo; Ikeda, Manabu; Miyakawa, Seii; Iijima, Kazunori; Terayama, Takao; and Matsui, Takeshi, 4,441,133, Cl. 360-130.220.

Termolar S/A: *See*—
De Freitas, Elias M., 4,440,328, Cl. 222-538.000.

Teske, Lothar. Ash-removal conveyor for a coal-fired boiler. 4,440,097, Cl. 110-167.000.

Texaco Development Corporation: *See*—
Hunter, Walter D., 4,440,652, Cl. 252-8.55D.

Texaco Inc.: *See*—
Sanderson, John R.; Watts, Lewis W., Jr.; and Brader, Walter H., Jr., 4,440,870, Cl. 502-207.000.

Texas A & M University System, The: *See*—
Dhar, Hari P.; Bockris, John O.; and Lewis, Donald H., 4,440,611, Cl. 204-147.000.

Texas Instruments Incorporated: *See*—
Henderson, Alva E.; and Wiggins, Richard H., 4,441,201, Cl. 381-51.000.
McDonough, Kevin C.; Hayn, John W.; Bellay, Jeffrey D.; and Thaden, Robert C., 4,441,154, Cl. 364-200.000.

Thaden, Robert C.: *See*—
McDonough, Kevin C.; Hayn, John W.; Bellay, Jeffrey D.; and Thaden, Robert C., 4,441,154, Cl. 364-200.000.

Theobald, Roger D., to Cox Hobbies Inc. Model airplane engine starter. 4,440,122, Cl. 123-185.00D.

Thiokol Corporation: *See*—
Berkley, George A., 4,440,060, Cl. 89-1.50D.

Thomas, Frank-Gerhard: *See*—
Berkes, Klaus; Forster, Helmut; Huth, Wolfgang; Ritschel, Gunter; Schebiella, Georg; Scholz, Norbert; and Thomas, Frank-Gerhard, 4,440,797, Cl. 426-613.000.

Thomas, George L., to General Electric Company. Lamp seal glass. 4,441,051, Cl. 313-579.000.

Thomas, Rodney E. Curl lifting comb or pick. 4,440,180, Cl. 132-11.00R.

Thomas, William M.; and Smith, Richard D., to Stewart Engineering and Equipment Co. Group end sensor. 4,440,288, Cl. 198-425.000.

Thompson, Charles E., to Engelhard Corporation. Catalyst composition and method for its manufacture. 4,440,874, Cl. 502-327.000.

Thompson, Jerome A.: *See*—
Olson, Gene E.; Thompson, Jerome A.; Grover, Donald D.; Stout, Christopher B.; and Becker, Thomas P., 4,441,021, Cl. 250-227.000.

Thompson, Randall G.: *See*—
Swindell, Harold J.; and Thompson, Randall G., 4,440,725, Cl. 422-62.000.

Thompson, Richard J.; and Fruchtnicht, Ocke C., to United States of America, Army. Method of making rocket motor case with integral nozzle. 4,440,587, Cl. 156-154.000.

Thomson-CSF: *See*—
Facoetti, Hugues; Menoret, Philippe; Micheron, Francois; Petit, Patrick; and Ravinet, Pierre, 4,440,983, Cl. 179-110.00A.
Resneau, Jean-Claude; Roset, Pierre; and Doyen, Jean, 4,440,828, Cl. 428-334.000.

Thomson, Donald W., to Morris, Claude W., a part interest. Implement clutch and brake control. 4,440,277, Cl. 192-12.00D.

Thornton, Jack C.; and Russell, Randy G., to Rockwell International Corporation. Variable inductance with variable pickoff and variable flux medium permeability. 4,441,092, Cl. 336-130.000.

Thorson, John T., to Douglas, Walter L. Microprocessor controller for simultaneously controlling a PBX and providing multiple user access for general purpose data processing. 4,440,986, Cl. 179-2.0DP.

Thubeauville, Heinz: *See*—
Struck, Carl-Heinz; Schumacher, Ralf; and Thubeauville, Heinz, 4,440,599, Cl. 202-141.000.

Timmele Laminering AB: *See*—
Ahlm, Lars, 4,440,817, Cl. 428-71.000.

Tipton, Robert G., Jr. Gate valve. 4,440,381, Cl. 251-214.000.

Tirole, Jacques P. H.: *See*—
Aubert, Jean-Pierre P. A.; and Tirole, Jacques P. H., 4,440,834, Cl. 428-554.000.

Tkach, Khaim B.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Inoue, Hiroshi; Isoi, Masaaki; and Sei, Kazuo, 4,440,911, Cl. 525-301.000.

Togari, Osamu; Matsuda, Masatoshi; Shimokawa, Kenji; and Makabe, Toshiji, to Chiyoda Chemical Engineering & Construction Co., Ltd. Process for hydrocracking heavy hydrocarbon oils and catalyst therefor. 4,440,631, Cl. 208-112.000.

Tojza, Roman A.: *See*—
Hooker, Donald E.; and Tojza, Roman A., 4,440,036, Cl. 74-153.000.

Tokico Ltd.: *See*—
Yuji, Soeda; and Goto, Akio, 4,439,976, Cl. 53-403.000.

Tokyo Denki Kabushiki Kaisha: *See*—
Ihara, Keisuke; Hoshino, Shozi; and Tanioka, Susumu, 4,440,074, Cl. 99-510.000.

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Hatakeyama, Siro; Oba, Harutaro; and Ukai, Yoshitaka, 4,441,110, Cl. 346-140.00R.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hirata, Akio, 4,441,148, Cl. 363-54.000.
Iida, Kazuhiko, 4,441,208, Cl. 382-56.000.
Kanuma, Akira, 4,441,158, Cl. 364-758.000.
Moriwaki, Yoshinaga; Horike, Masaki; and Kamiya, Masashi, 4,441,026, Cl. 250-561.000.
Moriya, Yoshiaki; Mitani, Ryo; and Kobayashi, Atsushi, 4,441,031, Cl. 307-66.000.
Oota, Hiroyuki; Aoshima, Terutaka; Yamamori, Kenji; and Narita, Ryuho, 4,441,016, Cl. 219-441.000.
Sasaki, Itsuo; and Suzuki, Hiroaki, 4,441,169, Cl. 365-190.000.
Taguchi, Yasuo; and Nakao, Satoshi, 4,440,130, Cl. 123-427.000.
Tanaka, Masamichi; and Wada, Hiroto, 4,441,038, Cl. 307-400.000.

Tolliver, Wilbur E. Circumferential stirrup panel. 4,439,972, Cl. 52-651.000.

Tomikawa, Kouichi; and Takahashi, Hiroshi, to Engineering Resources Development Office. Method and apparatus of blowing mortar or the like. 4,440,499, Cl. 366-3.000.

Tomiyasu, Hiroshi; and Tanaka, Hiroaki, to Sankyo Dengyo Co., Ltd. Impact flow meter. 4,440,029, Cl. 73-861.730.

Tommasini, Rocco M.: *See*—
Haloburdo, Joseph J., Jr.; and Tommasini, Rocco M., 4,440,508, Cl. 374-144.000.

Tong, Yit C.; Seligman, Peter M.; Clark, Graeme M.; Patrick, James F.; and Millar, John B., to University of Melbourne, The. Speech processor. 4,441,202, Cl. 381-68.000.

Toohey, William J., to Russell, Larry. Arc voltage control circuit for welding apparatus. 4,441,009, Cl. 219-124.030.

Tootle, James N., to Pneumo Corporation. Hydraulic cowl door actuator with anti-vibration loading device, and assembly employing same. 4,440,068, Cl. 92-85.00A.

top-element Bauelemente fur Innenausbau + Raumgestaltung GmbH & Co. KG: *See*—
Langenhorst, Gunter, 4,439,965, Cl. 52-211.000.

Toppan Printing Co., Ltd.: *See*—
Yamaguchi, Takashi, 4,440,840, Cl. 430-4.000.

Toray Industries, Inc.: *See*—
Asakura, Toshiyuki; Kobayashi, Hiroaki; and Noguchi, Yukio, 4,440,915, Cl. 525-537.000.
Matsumoto, Tadayuki; Imaeda, Kozo; Mineo, Masatoshi; and Nakagawa, Kiyoshi, 4,439,903, Cl. 28-258.000.

Torii, Shunichi: *See*—
Matsuura, Tsuguo; Torii, Shunichi; and Shimizu, Tsuguo, 4,441,152, Cl. 364-200.000.

Tosaka, Yasuo; and Ogi, Keiji, to Konishiroku Photo Industry Co., Ltd. Method for the formation of a direct positive image. 4,440,851, Cl. 430-378.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Ishibashi, Junya; Miyazaki, Shigeru; and Tanaka, Shoichi, 4,440,511, Cl. 384-278.000.
Sasaki, Junichi; and Okayama, Yoshihiko, 4,441,161, Cl. 364-900.000.

Toshiba Netsukigu Kabushiki Kaisha: *See*—
Amano, Kazunori; Aizawa, Bunji; Ibe, Akio; and Sekikawa, Yoichi, 4,440,147, Cl. 126-201.000.

Totoku Co., Ltd.: *See*—
Morimoto, Tsuyoshi, 4,440,309, Cl. 220-235.000.

Totten, Adrian M.: *See*—
Pounder, Edwin; Arena, Alan J.; Pawlowski, Michael; and Totten, Adrian M., 4,440,030, Cl. 73-861.870.

Toyo Boseki Kabushiki Kaisha: *See*—
Kuze, Katsuaki; Matsuyama, Yuziro; Hashimoto, Hiroshi; Ohta, Takeshi; and Makimura, Osamu, 4,440,924, Cl. 528-275.000.

Toyo Contact Lens Co., Ltd.: *See*—
Tsuzuki, Akira; Kibe, Takeo; and Hioki, Shunichi, 4,440,662, Cl. 252-106.000.

Toyo Kogyo Co. Ltd.: *See*—
Shiihara, Takeo; Niihara, Toshihiro; Iwata, Hidemi; and Ishii, Noboru, 4,440,236, Cl. 173-8.000.

Toyo Systems, Ltd.: *See*—
Hayashibe, Shuji, 4,441,151, Cl. 364-157.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Yamakage, Tetsuro, 4,440,530, Cl. 408-3.000.

Toyoshima, Toshihiko, to Fuji Xerox Co., Ltd. Method and apparatus for applying signal voltages to electrostatic recording multi-stylus electrode assembly. 4,441,111, Cl. 346-154.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Kawagoe, Michio; and Tanaka, Masaaki, 4,440,140, Cl. 123-571.000.
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,440,276, Cl. 192-3.290.
Mori, Akio; Watanabe, Shozo; Matsunaga, Mitsunobu; Machizawa, Kenzi; and Minowa, Ryohei, 4,439,999, Cl. 62-238.300.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Hattori, Tadashi; Ozaki, Tadashi; Ootsuka, Yoshinori; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,440,014, Cl. 73-35.000.
Kobayashi, Nobuyuki; and Isobe, Toshiaki, 4,440,119, Cl. 123-492.000.
Nakano, Jiro; and Watanabe, Yohei, 4,440,128, Cl. 123-339.000.
Tsujimura, Masakuni; Miyagi, Hideo; Kohashi, Mamoru; and Kurii, Masaaki, 4,440,141, Cl. 123-609.000.

TRAK Sportartikel GmbH: *See*—
Staufer, Adolf, 4,440,418, Cl. 280-604.000.

Trappmann, Klaus: *See*—
Weiler, Wolfgang; and Trappmann, Klaus, 4,439,981, Cl. 60-39.320.
Weiler, Wolfgang; and Trappmann, Klaus, 4,439,982, Cl. 60-39.320.

Trcka, James S., to Rockwell International Corporation. Illuminated passive display from an oblique angle. 4,440,474, Cl. 350-345.000.

Tremayne, Edward C.: *See*—
Keeler, Arthur A.; Rice, William M.; and Tremayne, Edward C., 4,440,366, Cl. 244-138.00R.

Treuhaft, Martin B.; and Winquist, Knut L. Actuator. 4,440,325, Cl. 222-402.140.

Tri Tool Inc.: *See*—
Astle, William H., 4,440,531, Cl. 408-82.000.

Trickel, Lorn L.; and Stultz, William H., to Precured RDF Tirefill, Inc. Composite, solid, vehicle tire. 4,440,208, Cl. 152-314.000.

Trieber, Alan J.: *See*—
Zomorodi, Mostafa; and Trieber, Alan J., 4,440,815, Cl. 428-35.000.

Trinity Associates: *See*—
Christine, William C., 4,440,316, Cl. 222-83.500.

Trio Kabushiki Kaisha: *See*—
Sakamoto, Hideto, 4,441,085, Cl. 330-293.000.

Trivedi, Jitendra K.: *See*—
Caputo, William R.; and Trivedi, Jitendra K., 4,440,024, Cl. 73-529.000.

Trutzschler: *See*—
Schwiers, Friedrich-Wilhelm; and Trutzschler, 4,439,894, Cl. 19-0.200.

Trutzschler GmbH & Co. KG: *See*—
Schwiers, Friedrich-Wilhelm; and Trutzschler, 4,439,894, Cl. 19-0.200.

Tsai, Lung-Wen, to General Motors Corporation. Half speed balancer. 4,440,123, Cl. 123-192.00B.

Tsubakimoto Chain Company: *See*—
Murai, Masasumi; Kondo, Hirokazu; and Takino, Shigekatzu, 4,440,090, Cl. 104-127.000.

Tsuboi, Hikotada: *See*—
Fujikake, Shiro; Kawamata, Motoo; and Tsuboi, Hikotada, 4,440,920, Cl. 528-128.000.

Tsuchie, Takanori: *See*—
Miyazaki, Haruhiko; Uda, Taizo; Hirai, Koichi; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,440,873, Cl. 502-244.000.

Tsuji, Teruji; Hahashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, to Shionogi & Co., Ltd. Cyclization to form cephem ring and azetidinone intermediates therefor. 4,440,683, Cl. 260-239.00A.

Tsujimura, Masakuni; Miyagi, Hideo; Kohashi, Mamoru; and Kurii, Masaaki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling energizing interval of ignition coil of an internal combustion engine. 4,440,141, Cl. 123-609.000.

Tsukamoto, Moriaki: *See*—
Yamamoto, Takanobu; Sumida, Isao; Tsukamoto, Moriaki; Imani, Kazutake; and Watahiki, Naohisa, 4,440,151, Cl. 126-433.000.

Tsukamoto, Nobuo: *See*—
Kita, Yasuhiro; Tsukamoto, Nobuo; Koya, Masahiro; and Maeda, Narimichi, 4,441,192, Cl. 375-14.000.

Tsuzuki, Akira; Kibe, Takeo; and Hioki, Shunichi, to Toyo Contact Lens Co., Ltd. Cleaning composition for contact lenses. 4,440,662, Cl. 252-106.000.

Tsuzuki, Kunihiro: *See*—
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; and Tsuzuki, Kunihiro, 4,440,139, Cl. 123-569.000.

Tsvetkov, Evgeny N.: *See*—
Kostylev, Alexandr D.; Gileta, Vladimir P.; Grigoraschenko, Vladimir A.; Tkach, Khaim B.; Bakunin, Vladimir A.; Frenkel, Valery Y.; Kozlov, Valery A.; Reifisov, Jury B.; Chepurnoi, Nikolai P.; Bondar, Mikhail J.; Drobyazko, Vladimir F.; Stazhevsky, Stanislav B.; Ratskevich, Gerald I.; Fedorov, Alexandr A.; Polyakov, Anatoly S.; Bobylev, Leonid M.; Tsvetkov, Evgeny N.; and Petreev, Anatoly M., 4,440,240, Cl. 175-20.000.

Tulaba, Sauljus A.: *See*—
Balchjunas, Povilas I.; Martinaitis, Ionas J.; Tulaba, Sauljus A.; and Pilkauskas, Alfredas B., 4,441,055, Cl. 315-288.000.

Tunzi, Burton R.: *See*—
Pao, John; and Tunzi, Burton R., 4,440,977, Cl. 179-2.0DP.

Turbett, Robert J., to Union Carbide Corporation. Compositions of hydrocarbon-substituted diphenyl amines and high molecular weight polyethylene glycols; and the use thereof as water-tree retardants for polymers. 4,440,671, Cl. 252-573.000.

Turn-Styles Limited: *See*—
Hicks, Mervyn L., 4,440,110, Cl. 119-14.080.

Turner, George F. A. M.: *See*—
Moore, Michael H.; Moss, Brian F.; and Turner, George F. A. M., 4,440,490, Cl. 355-72.000.

Tuttle, Douglas J., to Babcock & Wilcox Company. Bias bellows for thermohydraulic feedwater regulator. 4,440,114, Cl. 122-451.200.

Twin City International Inc.: *See*—
Joffe, Boris B.; Spongr, Jerry J.; and Sawyer, Byron E., 4,441,022, Cl. 250-308.000.

Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez F., 4,439,992, Cl. 62-82.000.

U.T. Board of Regents: *See*—
Judy, Millard M.; and Sutko, John L., 4,440,638, Cl. 210-198.200.

Ube Industries, Ltd.: *See*—
Makino, Hiroshi; Kusuki, Yoshihiro; Harada, Takashi; Shimazaki, Hiroshi; and Isida, Tosio, 4,440,643, Cl. 210-500.200.
Matsui, Kanenobu; Uchiumi, Shinichiro; Asada, Hideki; and Umezu, Takashi, 4,440,928, Cl. 544-309.000.
Miyazaki, Haruhiko; Uda, Taizo; Hirai, Koichi; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,440,873, Cl. 502-244.000.

Uchida, Keiichi: *See*—
Oda, Yoshio; Uchida, Keiichi; Morimoto, Takeshi; and Kumai, Seisaku, 4,440,948, Cl. 562-532.000.

Uchida, Masaaki: *See*—
Ikezawa, Kenji; Takao, Hiroshi; Ambe, Satoshi; and Uchida, Masaaki, 4,439,911, Cl. 29-570.000.
Kitahara, Tsuyoshi; Uchida, Masaaki; and Sone, Kohki, 4,440,621, Cl. 204-406.000.

Uchiumi, Shinichiro: *See*—
Matsui, Kanenobu; Uchiumi, Shinichiro; Asada, Hideki; and Umezu, Takashi, 4,440,928, Cl. 544-309.000.

Uchiya, Tsuneo; Yabuta, Hiroaki; and Hikizi, Seizi, to Hitachi Plant Engineering & Construction Co., Ltd. Electrostatic particle precipitator. 4,440,552, Cl. 55-114.000.

Uda, Taizo: *See*—
Miyazaki, Haruhiko; Uda, Taizo; Hirai, Koichi; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,440,873, Cl. 502-244.000.

Ueki, Yoshiharu; and Sakaguchi, Shouzaburou, to Pioneer Electronic Corporation. Tape drive device in recording and reproducing device. 4,441,127, Cl. 360-71.000.

Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, to Nippon Oil Co., Ltd. Starting pitches for carbon fibers. 4,440,624, Cl. 208-22.000.

Uenishi, Haruyuki: *See*—
Miyano, Ryuzo; Uenishi, Haruyuki; Akatani, Hisashi; and Akamine, Takenori, 4,441,001, Cl. 200-308.000.

Uffner, William E., to Owens-Corning Fiberglas Corporation. Rubber-modified asphalt composition. 4,440,816, Cl. 428-40.000.

Uhde GmbH: *See*—
Honolke, Friedrich; Brandl, Adrian; Schibilla, Eduard; and Hohne, Gerhard, 4,440,544, Cl. 44-51.000.

Uher, Edmond. Tumbler lock. 4,440,008, Cl. 70-364.00R.

Uhlig, Uwe: *See*—
Oppelt, Peter; Uhlig, Uwe; Redeker, Werner; and Peschik, Werner, 4,439,951, Cl. 51-80.00R.

Ukai, Yoshitaka: *See*—
Hatakeyama, Siro; Oba, Harutaro; and Ukai, Yoshitaka, 4,441,110, Cl. 346-140.00R.

Ullrich, Axel: *See*—
Rutter, William J.; Goodman, Howard M.; Ullrich, Axel; Shine, John; Chirgwin, John; and Pictet, Raymond, 4,440,859, Cl. 435-172.000.

Um, Ik W.: *See—*
Kim, Sung J.; Um, Ik W.; and Park, Won J., 4,440,934, Cl. 548-312.000.
UMC Industries, Inc.: *See—*
Heller, Werner H., 4,440,044, Cl. 74-804.000.
Umetsu, Junji: *See—*
Urano, Fumio; and Umetsu, Junji, 4,440,403, Cl. 277-81.00R.
Umezu, Kohei: *See—*
Terayama, Hiroshi; Morita, Yoshiharu; and Umezu, Kohei, 4,440,788, Cl. 424-320.000.
Umezu, Takashi: *See—*
Matsui, Kanenobu; Uchiumi, Shinichiro; Asada, Hideki; and Umezu, Takashi, 4,440,928, Cl. 544-309.000.
Unicorn Electrical Products: *See—*
Siglock, John V., 4,441,056, Cl. 315-290.000.
Union Carbide Corporation: *See—*
Bailey, John C., 4,440,836, Cl. 429-48.000.
Kazaitis, Michael P., 4,439,890, Cl. 17-1.00R.
Keogh, Michael J., 4,440,907, Cl. 525-106.000.
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 4,440,871, Cl. 502-214.000.
Robeson, Lloyd M., 4,440,890, Cl. 524-159.000.
Turbett, Robert J., 4,440,671, Cl. 252-573.000.
Unipunch Products, Inc.: *See—*
Weisbeck, Ralph L., 4,440,052, Cl. 83-140.000.
Uniroyal, Inc.: *See—*
Paddock, Charles F., 4,440,825, Cl. 428-318.600.
Unisearch Limited: *See—*
Morton, David H.; Szirmai, Stephen G.; and Potter, Edmund C., 4,440,800, Cl. 427-13.000.
United States of America
Agriculture: *See—*
Biller, Cleveland J.; and Johnson, David D., 4,440,305, Cl. 212-90.000.
Air Force: *See—*
Witucki, Edward F.; and Flanagan, Joseph E., 4,440,687, Cl. 260-349.000.
Army: *See—*
Eitel, Frederick G., 4,440,506, Cl. 374-32.000.
Howe, Philip M.; Gibbons, Gould; Aseltine, Clifford L.; and Williams, Frank, 4,440,296, Cl. 206-3.000.
Pollard, John H.; and Ramsey, John B., Jr., 4,439,912, Cl. 29-572.000.
Scovill, John P.; Klayman, Daniel L.; Massie, Samuel P.; Grant, Steven D.; Gonzalez, Armando; Morrison, Norman E.; and Dobek, Arthur S., 4,440,771, Cl. 424-258.000.
Thompson, Richard J.; and Fruchtnicht, Ocke C., 4,440,587, Cl. 156-154.000.
Zangrando, Roy A., 4,440,063, Cl. 89-135.000.
Energy: *See—*
Anderson, David F., 4,441,024, Cl. 250-380.000.
Dale, Steinar J., 4,440,970, Cl. 174-14.00R.
Rose, Ronald P., 4,440,714, Cl. 376-104.000.
Shimotake, Hiroshi; and Bartholme, Louis G., 4,440,837, Cl. 429-112.000.
Health and Human Services: *See—*
Neville Jr., David M.; and Youle, Richard J., 4,440,747, Cl. 424-85.000.
National Aeronautics and Space Administration: *See—*
Dunn, Thomas J., 4,439,968, Cl. 52-404.000.
National Security Agency: *See—*
Cohen, Jonathan D., 4,440,472, Cl. 350-162.120.
Navy: *See—*
Biblarz, Oscar; Miller, James A.; and Laib, Ronald J., 4,439,980, Cl. 60-39.060.
Holtrop, John W., 4,440,365, Cl. 244-137.00R.
McEachern, James F., 4,441,173, Cl. 367-13.000.
Sheem, Sang K., 4,440,498, Cl. 356-350.000.
U.S. Philips Corporation: *See—*
Bakker, Pieter, 4,440,980, Cl. 179-81.00R.
Gerritsen, Jan, 4,441,120, Cl. 358-10.000.
Kaanders, Johannes M. G. M.; van Rijsewijk, Cornelis H. M.; and Smerecnik, Antoon F., 4,440,982, Cl. 179-107.00R.
Khoe, Giok D., 4,440,470, Cl. 350-96.200.
Lippits, Gerardus J. M.; Van Den Broek, Arnoldus J. M.; Op Het Veld, Adriaan J. G.; Dijkstra, Rinse; and De Jonge, Jelis, 4,440,586, Cl. 156-151.000.
Rosenthal, Manfred; and Weber, Wendelin, 4,440,516, Cl. 400-616.100.
Smid, Albert; and Haisma, Jan, 4,440,699, Cl. 264-1.400.
Sprengers, Leo M., 4,441,045, Cl. 313-25.000.
Swart, Louis M., 4,441,122, Cl. 358-41.000.
Ten Pas, Jan L., 4,441,108, Cl. 343-857.000.
Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; De Meester, Emiel P. J.; Van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., 4,441,049, Cl. 313-486.000.
United Technologies Corporation: *See—*
Donnelly, Brian G.; and Stearns, Charles F., 4,440,192, Cl. 137-501.000.
Haloburdo, Joseph J., Jr.; and Tommasini, Rocco M., 4,440,508, Cl. 374-144.000.
Hansen, Kenneth P., 4,440,191, Cl. 137-468.000.
Madden, William M.; and Wiley, Walter H., 4,440,347, Cl. 239-265.390.
Mottier, Francois M., 4,440,839, Cl. 430-2.000.
Wiley, Walter H., 4,440,346, Cl. 239-265.390.
Univeral Electric Company: *See—*
Colwell, Robert, 4,441,042, Cl. 310-42.000.
University of California, The Regents of the: *See—*
Rutter, William J.; Goodman, Howard M.; Ullrich, Axel; Shine, John; Chirgwin, John; and Pictet, Raymond, 4,440,859, Cl. 435-172.000.
University of Dayton: *See—*
Minardi, John E.; Lawson, Maurice O.; von Ohain, Hans P.; and Salyer, Ival O., 4,439,988, Cl. 60-649.000.
University of Kentucky Research Foundation, The: *See—*
Kao, David T., 4,441,029, Cl. 290-52.000.
University of Melbourne, The: *See—*
Tong, Yit C.; Seligman, Peter M.; Clark, Graeme M.; Patrick, James F.; and Millar, John B., 4,441,202, Cl. 381-68.000.
University of Michigan, Regents of the: *See—*
Lougheed, Robert M.; and Mudge, Trevor N., 4,441,207, Cl. 382-8.000.
University Patents, Inc.: *See—*
Wilkins, Ebtisam, 4,440,175, Cl. 128-635.000.
UOP Inc.: *See—*
Stine, Laurence O., 4,440,629, Cl. 208-111.000.
Upeslacis, Janis; Schaub, Robert E.; and Bernstein, Seymour, to American Cyanamid Company. Poly-cation salts of bis(or tris)[4-O-monohexose-oxy]-arylene sulfate derivatives. 4,440,758, Cl. 424-180.000.
Urabe, Hirokuni, to Shigiya-Machinery Works Ltd. Unusual vibration transducer apparatus in machine tools. 4,441,103, Cl. 340-680.000.
Urano, Fumio; and Umetsu, Junji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Drop-proof and dust-proof device in rotary operation section of camera. 4,440,403, Cl. 277-81.00R.
Urban Transportation Development Corporation Ltd.: *See—*
Sobolewski, George, 4,440,092, Cl. 104-291.000.
Ushio Denki Kabushiki Kaisha: *See—*
Horiuchi, Tatsuo; and Kiyota, Kazushige, 4,441,144, Cl. 362-375.000.
Usui, Kenji: *See—*
Suzuki, Yoshitsugu; Iizuka, Syogo; Kajiyama, Shigeo; Usui, Kenji; and Kobayashi, Masahiro, 4,440,053, Cl. 83-282.000.
USV Pharmaceutical Corporation: *See—*
Huang, Fu-chih, 4,440,935, Cl. 548-326.000.
Lee, Thomas D.; and Brown, Richard E., 4,440,929, Cl. 544-346.000.
Suh, John T.; Menard, Paul R.; and Jones, Howard, 4,440,941, Cl. 560-20.000.
Valko, Joseph T., to PPG Industries, Inc. Resinous compositions curable through a transesterification curing mechanism. 4,440,612, Cl. 204-181.00C.
Vallod, Joseph: *See—*
Borne, Andre; Vallod, Joseph; and Curvat, Rene, 4,440,049, Cl. 81-467.000.
Valmet Oy: *See—*
Karras, Matti R.; and Hirsimaki, Olavi, 4,440,507, Cl. 374-39.000.
Koski, Erkki; and Tapio, Olli, 4,440,598, Cl. 162-305.000.
Van Buskirk, E. James; and Ennis, James, to Silver Industries. Tamper-evident closure. 4,440,306, Cl. 215-230.000.
Van Den Broek, Arnoldus J. M.: *See—*
Lippits, Gerardus J. M.; Van Den Broek, Arnoldus J. M.; Op Het Veld, Adriaan J. G.; Dijkstra, Rinse; and De Jonge, Jelis, 4,440,586, Cl. 156-151.000.
Van de Spijker, Willebrordus H. M. M.: *See—*
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van Dongeren, Jan P., to Wavin B.V. Plastic tube with longitudinal channels in the wall. 4,440,195, Cl. 138-115.000.
Van Duzee, Barry F.: *See—*
Fawzi, Mahdi B.; Benedict, James J.; Bugaj, Joseph E.; Degenhardt, Charles R.; and Van Duzee, Barry F., 4,440,738, Cl. 424-1.100.
van Dyke, Martin J.: *See—*
Gerchman, Robert D.; Newport, Ronald L.; and van Dyke, Martin J., 4,441,157, Cl. 364-551.000.
VanEffen, Richard M.; McLean, James D.; and Decker, Dalton L., to Dow Chemical Company, The. Apparatus and method for measuring dissolved halogens. 4,440,603, Cl. 204-1.00T.
van Mil, Martinus P. G., to Stork PMT B.V. Device for dividing slaughtered poultry. 4,439,891, Cl. 17-11.000.
van Rijs, Gerrit A.; Kardol, Arie D.; and Hinze, Adrien G., to Internationale Octrooi Maatschappij "Octropa" B.V. Ester lubricants. 4,440,660, Cl. 252-56.00S.
van Rijsewijk, Cornelis H. M.: *See—*
Kaanders, Johannes M. G. M.; van Rijsewijk, Cornelis H. M.; and Smerecnik, Antoon F., 4,440,982, Cl. 179-107.00R.
Van Vliet, James G.; and Aralis, Frank M., to Beckman Instruments, Inc. Display system and method. 4,441,105, Cl. 340-750.000.
Vardi, Isaih; Kimchi, Yigal; and Ben-Dror, Jonathan, to Eshel Residual Energy for Cooling and Heating Ltd. Chillers. 4,440,001, Cl. 62-475.000.
Varghese, Philip: *See—*
Derbyshire, Francis J.; Varghese, Philip; and Whitehurst, Darrell D., 4,440,622, Cl. 208-8.0LE.
Varo, Inc.: *See—*
Evans, William E.; and Gillett, Jimmie D., 4,441,062, Cl. 318-703.000.

Vasalos, Iacovos A.; and Wollaston, Eugene G., to Standard Oil Company (Indiana). Catalytic cracking with reduced emission of noxious gas. 4,440,632, Cl. 208-113.000.

Vasudev, Prahalad K., to Hughes Aircraft Company. Process for fabrication of monolithic transistor coupled electroluminescent diode. 4,439,910, Cl. 29-569.00L.

Vaughan, Quentin D., to Visual Graphics Corporation. Mandrel and core assembly for large format cameras. 4,440,357, Cl. 242-68.500.

Veb Kombinat Nagema: *See—*
Berkes, Klaus; Forster, Helmut; Huth, Wolfgang; Ritschel, Gunter; Schebiella, Georg; Scholz, Norbert; and Thomas, Frank-Gerhard, 4,440,797, Cl. 426-613.000.

Vehovic, David: *See—*
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Velman, Boris A. Recreational sleigh. 4,440,408, Cl. 280-7.120.

Velsicol Chemical Corporation: *See—*
Stach, Leonard J., 4,440,567, Cl. 71-105.000.

Verdol S.A.: *See—*
Arvai, Tibor, 4,440,196, Cl. 139-59.000.
Winkelmann, Roland, 4,439,979, Cl. 57-58.860.

Verlijsdonk, Johannus G.: *See—*
Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; De Meester, Emiel P. J.; Van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., 4,441,049, Cl. 313-486.000.

Verriet, Johannes G.: *See—*
Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; De Meester, Emiel P. J.; Van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., 4,441,049, Cl. 313-486.000.

Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; De Meester, Emiel P. J.; Van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., to U.S. Philips Corporation. Luminescent material and discharge lamp containing the same. 4,441,049, Cl. 313-486.000.

Vertut, Jean: *See—*
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Vesnier, Patrick H.: *See—*
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Benecke, Herman P.; and Sherwood, Bob E., 4,440,781, Cl. 424-285.000.

Virgilio, Gustav, to Robert Bosch GmbH. Electronic control device for the fuel metering system of an internal combustion engine. 4,440,127, Cl. 123-325.000.

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Voelter, Wolfgang: *See—*
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von Ohain, Hans P.: *See—*
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W. C. Heraeus GmbH: *See—*
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Wadia, Darius A. Method and apparatus for processing raw meal having a high alkali chloride and/or sulfate content. 4,440,578, Cl. 106-100.000.

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Wallace, John A.; and Bader, Bernard R., to Black Clawson, Inc. Fabric insertion system. 4,440,088, Cl. 104-7.00A.

Wallman, P. Henrik, to Chevron Research Company. Recycle classifier for retorting oil shale. 4,440,623, Cl. 208-11.00R.

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Walsh, David A., to A. H. Robins Company, Inc. Methods of using 2-aminobiphenylacetic acids, esters, and metal salts thereof to treat inflammation. 4,440,785, Cl. 424-317.000.

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Webb, Charles E., to Basic American Industries. Flow sensing apparatus. 4,441,102, Cl. 340-673.000.
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Girard, Maurice V.; Worrall, Michael J.; and Seguy, Bernard R., 4,440,549, Cl. 55-59.000.
Worringer, Thomas J.: *See—*
Allan, Kenneth N.; Worringer, Thomas J.; and Baugh, Robert T., 4,440,293, Cl. 198-813.000.
Wright, Kenneth N.: *See—*
Bradford, Marion M.; Orthoefer, Frank T.; and Wright, Kenneth N., 4,440,792, Cl. 426-271.000.
Wright Manufacturing Company: *See—*
Henley-Cohn, Julian L.; and Jakubczak, Eugene R., 4,439,872, Cl. 3-1.300.
Wright, Richard F.: *See—*
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,440,846, Cl. 430-138.000.
Wrona, Stanislaw, to International Business Machines Corporation. Correction apparatus for a cathode ray tube. 4,441,057, Cl. 315-368.000.
Wu, Ta-Ming: *See—*
Gaertner, Gregory E.; and Wu, Ta-Ming, 4,441,037, Cl. 307-265.000.
Wykhuis, Lloyd A.; and Kuhn, John B., to Deere & Company. Hydraulic lift arm assembly mounting arrangement. 4,440,415, Cl. 280-460.00A.
Xerox Corporation: *See—*
Hordon, Monroe J.; and Gerace, Robert E., 4,440,803, Cl. 427-74.000.
Howard, Anthony, 4,440,492, Cl. 355-76.000.
Yabuta, Hiroaki: *See—*
Uchiya, Tsuneo; Yabuta, Hiroaki; and Hikizi, Seizi, 4,440,552, Cl. 55-114.000.
Yagasaki, Akio; and Watanabe, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Wiper device. 4,439,886, Cl. 15-250.200.
Yagi, Yukinao: *See—*
Konagaya, Takeshi; and Yagi, Yukinao, 4,440,016, Cl. 73-40.000.
Yako, Kazunori: *See—*
Takeshige, Kenji; Hirabe, Kenji; Ogawa, Yukifumi; Arikata, Kazuyoshi; Yako, Kazunori; Sakai, Kenichi; Matsuo, Toshinori; and Kamio, Hiroshi, 4,440,584, Cl. 148-128.000.
Yamada, Haruyasu: *See—*
Shibata, Jun; Yamada, Haruyasu; Mori, Toshiki; and Takemoto, Toyoki, 4,441,198, Cl. 377-78.000.
Yamada, Hirohide: *See—*
Morita, Shigetoshi; and Yamada, Hirohide, 4,441,132, Cl. 360-126.000.
Yamada, Shigeru: *See—*
Kozuki, Koichi; Nakada, Akira; and Yamada, Shigeru, 4,440,056, Cl. 84-1.260.
Yamaguchi, Kazuo: *See—*
Mochida, Ei; Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; and Kosuzume, Hiroshi, 4,440,770, Cl. 424-258.000.
Yamaguchi, Takashi, to Toppan Printing Co., Ltd. Photographic image-processing method. 4,440,840, Cl. 430-4.000.
Yamaguchi, Yasumasa; Watanabe, Ichiro; and Satoh, Yoshiaki, to Nitto Chemical Industry Co., Ltd. Process for the continuous production of acrylamide or methacrylamide using microorganisms. 4,440,858, Cl. 435-129.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Sakurai, Yoshihiro, 4,440,697, Cl. 261-34.00A.
Yamakage, Tetsuro, to Toyoda Koki Kabushiki Kaisha. Machine tool with tool position compensating apparatus and contact detecting apparatus. 4,440,530, Cl. 408-3.000.
Yamakawa, Toru, to Fuji Jukogyo Kabushiki Kaisha. Internal combustion engine provided with a plurality of power units. 4,439,989, Cl. 60-718.000.
Yamamori, Kenji: *See—*
Oota, Hiroyuki; Aoshima, Terutaka; Yamamori, Kenji; and Narita, Ryuho, 4,441,016, Cl. 219-441.000.
Yamamoto, Atsuko: *See—*
Ikeda, Takeshi; Yamamoto, Atsuko; and Kasai, Masanao, 4,440,735, Cl. 423-561.00B.

Yamamoto, Katsutoshi: *See*—
Kawachi, Shoji; Yamamoto, Katsutoshi; and Kai, Shinichiro, 4,440,879, Cl. 523-200.000.

Yamamoto, Kazuhiro: *See*—
Miyakoshi, Shinichi; and Yamamoto, Kazuhiro, 4,440,413, Cl. 280-284.000.

Yamamoto, Shunichi: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,440,624, Cl. 208-22.000.

Yamamoto, Takanobu; Sumida, Isao; Tsukamoto, Moriaki; Imani, Kazutake; and Watahiki, Naohisa, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Solar heat collector. 4,440,151, Cl. 126-433.000.

Yamashita, Katsuji: *See*—
Katsumi, Ikuo; Kondo, Hideo; Yamashita, Katsuji; Hidaka, Takayoshi; Hosoe, Kazunori; Ariki, Yutaka; Yamashita, Toshiaki; and Watanabe, Kiyoshi, 4,440,784, Cl. 424-308.000.

Yamashita, Toshiaki: *See*—
Katsumi, Ikuo; Kondo, Hideo; Yamashita, Katsuji; Hidaka, Takayoshi; Hosoe, Kazunori; Ariki, Yutaka; Yamashita, Toshiaki; and Watanabe, Kiyoshi, 4,440,784, Cl. 424-308.000.

Yano, Kiyotosi: *See*—
Naito, Mitikatu; Yano, Kiyotosi; Itou, Kazuo; and Tsuzuki, Kunihiro, 4,440,139, Cl. 123-569.000.

Yano, Tsutomu: *See*—
Hayakawa, Yoshihiro; Yano, Tsutomu; Tachita, Ryobun; Fukukita, Hiroshi; Irioka, Kazuyoshi; and Fukumoto, Akira, 4,440,025, Cl. 73-642.000.

Yaslak, Salih: *See*—
Cadogan, John I. G.; Gosney, Ian; and Yaslak, Salih, 4,440,676, Cl. 260-112.50R.

Yazaki Corp.: *See*—
Suzuki, Yoshitsugu; Iizuka, Syogo; Kajiyama, Shigeo; Usui, Kenji; and Kobayashi, Masahiro, 4,440,053, Cl. 83-282.000.

Yazaki, Komei: *See*—
Fukushima, Masao; and Yazaki, Komei, 4,440,375, Cl. 248-559.000.

Yazawa, Hiroshi: *See*—
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,440,700, Cl. 264-8.000.

Yeazel, Howard T.: *See*—
Carroll, Arthur E., II; Lewis, Basil C., Jr.; and Yeazel, Howard T., 4,439,918, Cl. 29-840.000.

Yee, Joe: *See*—
Messineo, Salvatore B.; Lasswell, Don L.; and Yee, Joe, 4,440,607, Cl. 204-35.00N.

Yee, Lannie K.: *See*—
Sewell, Richard B. H.; Yee, Lannie K.; and Chappell, Robert W., 4,440,162, Cl. 128-202.220.

Yoshida, Junichi: *See*—
Fujisaki, Shigemi; Fujisaki, Takashi; Yoshida, Junichi; and Fujisaki, Yasuhiro, 4,440,749, Cl. 424-94.000.

Yoshida Kogyo K.K.: *See*—
Masuda, Yoshinori, 4,440,197, Cl. 139-431.000.
Takeshima, Kiyoshi; and Hasegawa, Akira, 4,439,898, Cl. 24-401.000.

Yoshida, Noriyuki; and Asai, Yoshimi, to Brother Kogyo Kabushiki Kaisha. Motor speed control system. 4,441,061, Cl. 318-329.000.

Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition comprising derivative of aminobenzoic acid for regulating prostaglandin. 4,440,757, Cl. 424-180.000.

Yoshioka, Mitsuru: *See*—
Tsuji, Teruji; Hahashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,440,683, Cl. 260-239.00A.

Yoshotomi Pharmaceutical Industries Ltd.: *See*—
Munakata, Tomohiko; Isagai, Katsuyoshi; Ikeda, Yoshifumi; Sakai, Junichi; and Matsuki, Hideo, 4,440,752, Cl. 424-118.000.

Youle, Richard J.: *See*—
Neville Jr., David M.; and Youle, Richard J., 4,440,747, Cl. 424-85.000.

Young, Peter T.: *See*—
Rice, Thomas E.; and Young, Peter T., 4,440,096, Cl. 108-3.000.

Young, Rodney C.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,440,775, Cl. 424-269.000.

Yourd, Raymond A., III: *See*—
Chromecek, Richard C.; Friends, Gary D.; Wissman, Lawrence Y.; and Yourd, Raymond A., III, 4,440,919, Cl. 526-263.000.

Yu, Kenneth K.: *See*—
McGibbon, Gregor D.; and Yu, Kenneth K., 4,440,979, Cl. 179-16.0EA.

Yuasa, Yoshio, to Minolta Camera Kabushiki Kaisha. Exposure aiding device for an enlarger. 4,440,489, Cl. 355-69.000.

Yuho Chemicals Inc.: *See*—
Takeuchi, Shoji; Nishiyama, Kozaburo; and Gomi, Tadashi, 4,440,661, Cl. 252-89.100.

Yui, Katsuhiko: *See*—
Ikegami, Hiroshi; Nagira, Norichika; and Yui, Katsuhiko, 4,440,583, Cl. 148-128.000.

Yuji, Soeda; and Goto, Akio, to Tokico Ltd. Method for filling gas into a metal container. 4,439,976, Cl. 53-403.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Bieber, Gerold, 4,440,272, Cl. 188-290.000.
Schreiner, Friedrich, 4,440,279, Cl. 192-30.00W.

Zangrando, Roy A., to United States of America, Army. Gun operated electrical firing device. 4,440,063, Cl. 89-135.000.

Zellner, Robert J.: *See*—
Opaskar, Vincent C.; Beach, Sidney C.; and Zellner, Robert J., 4,440,608, Cl. 204-43.00S.

Zer, Eliezer: *See*—
Gottlieb, David; and Zer, Eliezer, 4,440,540, Cl. 414-462.000.

Zimzik, Henry. Cooling emulsion and method of producing a cooling emulsion. 4,440,654, Cl. 252-34.700.

Zinke, Horst: *See*—
Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, 4,440,696, Cl. 260-976.000.

Zoller, Gerhard: *See*—
Effenberger, Franz; and Zoller, Gerhard, 4,440,686, Cl. 260-34.000.

Zollner, Dieter H.: *See*—
Vielstich, Gunther; Bauer, Hanns-Georg; Muhlenbeck, Josef; Otto, Josef; Feldhoff, Horst; Zollner, Dieter H.; and Rittmann, Friedrich, 4,441,190, Cl. 373-94.000.

Zommer, Nathan, to Intersil, Inc. Monolithically merged field effect transistor and bipolar junction transistor. 4,441,117, Cl. 357-43.000.

Zomorodi, Mostafa; and Trieber, Alan J., to Abbott Laboratories. Clear, autoclavable plastic formulation for medical liquid containers. 4,440,815, Cl. 428-35.000.

Zotov, Ivan P.: *See*—
Albertinsky, Boris I.; Dmitrieva, Nina M.; Evseev, Anatoly K.; Zotov, Ivan P.; Ivanov, Andrei S.; Sviniin, Mikhail P.; Suslov, Valentin A.; and Fedotov, Mikhail T., 4,441,150, Cl. 363-126.000.

Zscheile, John W., Jr.: *See*—
Kingston, Samuel C.; Spencer, Billie M.; Zscheile, John W., Jr.; and Price, Robert, 4,441,194, Cl. 375-96.000.

Zupan, Jacob A., to Merck & Co., Inc. Use of eucalyptol for enhancing skin permeation of bio-affecting agents. 4,440,777, Cl. 424-274.000.

Zvyagimtsev, Kirill N.: *See*—
Kreinin, Efim V.; Zvyagimtsev, Kirill N.; and Fedorov, Nikolai A., 4,440,224, Cl. 166-245.000.

Zychowski, Edwin A.; Jasenof, Kenneth E.; and Jimenez, Artemio L., to DeSoto, Inc. Thermosetting vinyl acetate tetrapolymer coatings. 4,440,894, Cl. 524-390.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF APRIL, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Eastman Kodak Company: *See*—

Meyer, James W.; and Mooney, John E., Re. 31,547, Cl. 354-135.000.

Meyer, James W.; and Mooney, John E., to Eastman Kodak Company. Exposure control mechanism for use with chemical flash. Re. 31,547, Cl. 354-135.000.

Mooney, John E.: *See*—

Meyer, James W.; and Mooney, John E., Re. 31,547, Cl. 354-135.000.

Takara Company, New York, Inc.: *See*—

Watanabe, Tony, Re. 31,548, Cl. 433-77.000.

Walker, Rocco D., to Zapata Industries, Inc. Anti-missiling bottle closure. Re. 31,546, Cl. 215-307.000.

Watanabe, Tony, to Takara Company, New York, Inc. Dental operatory system. Re. 31,548, Cl. 433-77.000.

Zapata Industries, Inc.: *See*—

Walker, Rocco D., Re. 31,546, Cl. 215-307.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

C. L. Frost & Son, Inc.: *See*—

Frost, Ruben E., B1 3,537,725, Cl. 308-187.200.

Chenevard, Alexis, to SAPAL Societe Anonyme des Plieuses Automatiques. Method and apparatus for placing objects in boxes. B1 4,048,780, 4-3-84, Cl. 53-448.000.

Frost, Ruben E., to C. L. Frost & Son, Inc. Trough-like seal for roller assembly. B1 3,537,725, 4-3-84, Cl. 308-187.200.

SAPAL Societe Anonyme des Plieuses Automatiques: *See*—

Chenevard, Alexis, B1 4,048,780, Cl. 53-448.000.

LIST OF DESIGN PATENTEES

AB Stille-Werner: *See*—

Peterson, Lars G. B.; and Schneider, Gerhard, 273,326, Cl. D24-27.000.

Abberger, Thomas A. Fish lure. 273,318, 4-3-84, Cl. D22-27.000.

Acrow (Engineers) Limited: *See*—

Young, George B. A., 273,334, Cl. D25-73.000.

Anchor Hocking Corporation: *See*—

Thrush, James L., 273,263, Cl. D7-319.000.

Apple Computer, Inc.: *See*—

Stewart, James R., 273,295, Cl. D14-109.000.

Archeskie, Joseph R. Adjustable portable hand drill press holder. 273,299, 4-3-84, Cl. D15-132.000.

Babcock & Wilcox Company, The: *See*—

Bean, Thomas R.; Stockmaster, Edward F.; and Whaley, George S., 273,291, Cl. D13-40.000.

Bannigan, Francis R. Combined lamp and powerboard. 273,335, 4-3-84, Cl. D26-51.000.

Barrera, Gilbert E. Combined toothpaste dispenser and toothbrush holder. 273,257, 4-3-84, Cl. D6-87.000.

Baxter Travenol Laboratories, Inc.: *See*—

Rouch, Ellen A., 273,330, Cl. D24-51.000.

Bean, Thomas R.; Stockmaster, Edward F.; and Whaley, George S., to Babcock & Wilcox Company, The. Digital logic module for mounting in a control panel. 273,291, 4-3-84, Cl. D13-40.000.

Belavitch, Alphonse L.: *See*—

Norton, Edward J.; Oparowski, Paul; and Belavitch, Alphonse L., 273,244, Cl. D2-310.000.

Bortz, Paul B., to Vermont Stove Co., Inc. Multi-purpose stove tool. 273,267, 4-3-84, Cl. D8-14.000.

Brownlee, Jerome E., to Dallas Fuel Laboratories, Inc. Heat exchanger housing. 273,324, 4-3-84, Cl. D23-136.000.

Bulgari, Marina, to Zoldia Anstalt (NOW) Marina B Creation S.A. Ring. 273,283, 4-3-84, Cl. D11-34.000.

Callais, Ivan G., Jr. Bleeding monster toy figure. 273,313, 4-3-84, Cl. D21-166.000.

Cambridge Instruments, Inc.: *See*—

Macquignon, Claude, 273,325, Cl. D24-17.000.

Caputo, Jackie: *See*—

Dubbin, Barbara; and Caputo, Jackie, 273,253, Cl. D6-61.000.

Casa Bella Imports, Inc.: *See*—

Dubbin, Barbara; and Caputo, Jackie, 273,253, Cl. D6-61.000.

Codman & Shurtleff, Inc.: *See*—

Walus, Richard L., 273,329, Cl. D24-41.000.

Cosper, John A. Gas pipe type fireplace log lighter. 273,321, 4-3-84, Cl. D23-90.100.

Crest Industries, Inc.: *See*—

Rasmussen, Harry R., 273,293, Cl. D14-66.000.

Crowley, James P.: *See*—

Semerjian, Joseph K.; and Crowley, James P., 273,337, Cl. D34-21.000.

Dallas Fuel Laboratories, Inc.: *See*—

Brownlee, Jerome E., 273,324, Cl. D23-136.000.

Dart Industries Inc.: *See*—

Wolff, Martin J., 273,262, Cl. D7-74.000.

Davidson, Keith J., to 432698 Ontario Ltd. Fireplace heat exchanger. 273,323, 4-3-84, Cl. D23-135.000.

Dilliner, Monte M., to Jones, Oscar E.; Lowe, Ted; and Robinson, Robert H., a part interest. Combined fuel injector and thermal heater. 273,296, 4-3-84, Cl. D15-05.000.

Dodds, Dale I., to J. J. Mauget Co. Feeder tube for plant injection device. 273,265, 4-3-84, Cl. D8-1.000.

Drummond, Stephen E. Clock. 273,279, 4-3-84, Cl. D10-1.000.

Dubbin, Barbara; and Caputo, Jackie, to Casa Bella Imports, Inc. Closed curved sofa. 273,253, 4-3-84, Cl. D6-61.000.

Duncan, Clarence R., Jr.: *See*—

Kemp, William P., III; and Duncan, Clarence R., Jr., 273,260, Cl. D6-198.000.

Eldon Industries, Inc.: *See*—

Evenson, Mel, 273,309, Cl. D19-75.000.

Elliston, Murray L. Fire pit or the like. 273,264, 4-3-84, Cl. D7-332.000.

Ethyl Corporation: *See*—

Hayes, Thomas H., 273,278, Cl. D9-434.000.

Eugene Doll & Novelty Co., Inc.: *See*—

Strauss, Steven, 273,277, Cl. D9-415.000.

Evans, Joseph M. Unicycle. 273,287, 4-3-84, Cl. D12-107.000.

Evenson, Mel, to Eldon Industries, Inc. Paper clip holder. 273,309, 4-3-84, Cl. D19-75.000.

Faidide, Christian, to S.A.R.L. Wichard. Safety hook. 273,273, 4-3-84, Cl. D8-367.000.

Fairaizen, Igal. Convertible sofa. 273,254, 4-3-84, Cl. D6-64.000.
Firm-A-Face, Inc.: *See*—
Hastings, Amy; and Patton, Douglas, 273,328, Cl. D24-41.000.
Fiskars Manufacturing Corporation: *See*—
Smith, Lloyd T., 273,268, Cl. D8-83.000.
Fleisler, Norman, to Powrmatic du Canada LTEE/Powrmatic of Canada Ltd. Stove for burning coal or wood. 273,322, 4-3-84, Cl. D23-97.000.
Gillette Company, The: *See*—
Markis, Beverly L., 273,275, Cl. D9-381.000.
Gruber, Robert, to Surgical Appliance Industries, Inc. Lumbo-sacral orthosis. 273,331, 4-3-84, Cl. D24-64.000.
Guertin, Joseph G. American family tree game panel or similar article. 273,312, 4-3-84, Cl. D21-25.000.
Gullett, Teresa G. Magazine holder or the like. 273,259, 4-3-84, Cl. D6-184.000.
Haigh, Richard B.; and Parker, Philip M., to Leco Corporation. Electronic balance. 273,280, 4-3-84, Cl. D10-91.000.
Harley-Davidson Motor Co., Inc.: *See*—
Johnson, Stanley A., 273,288, Cl. D12-182.000.
Hastings, Amy; and Patton, Douglas, to Firm-A-Face, Inc. Portable electronic facial and hand muscle toner. 273,328, 4-3-84, Cl. D24-41.000.
Hayes, Thomas H., to Ethyl Corporation. Container handle or similar article. 273,278, 4-3-84, Cl. D9-434.000.
Hollfelder, Thomas A., to Porta Systems Corp. Telephone connector block. 273,289, 4-3-84, Cl. D13-24.000.
Hollfelder, Thomas A., to Porta Systems Corp. Telephone connector block. 273,290, 4-3-84, Cl. D13-24.000.
Itakura, Hitoshi: *See*—
Yoshimura, Masaaki; and Itakura, Hitoshi, 273,311, Cl. D21-19.000.
J. J. Mauget Co.: *See*—
Dodds, Dale I., 273,265, Cl. D8-1.000.
Jacobsen, William A. Wood hauler. 273,286, 4-3-84, Cl. D12-6.000.
Johnson, Stanley A., to Harley-Davidson Motor Co., Inc. Motorcycle windshield. 273,288, 4-3-84, Cl. D12-182.000.
Jones, Oscar E.: *See*—
Dilliner, Monte M., 273,296, Cl. D15-05.000.
Kabushiki Kaisha Sato: *See*—
Matsuda, Yasuhiko; and Konda, Kouichi, 273,308, Cl. D18-13.000.
Kemp Furniture Industries, Inc.: *See*—
Kemp, William P., III; and Duncan, Clarence R., Jr., 273,260, Cl. D6-198.000.
Kemp, William P., III; and Duncan, Clarence R., Jr., to Kemp Furniture Industries, Inc. Combined headboard and hutch unit. 273,260, 4-3-84, Cl. D6-198.000.
Klim, Matthew J., to Matthew Klim Associates, Inc. Wine bottle. 273,276, 4-3-84, Cl. D9-383.000.
Konda, Kouichi: *See*—
Matsuda, Yasuhiko; and Konda, Kouichi, 273,308, Cl. D18-13.000.
Kurozumi, Shigeru, to Sharp Corporation. Electronic calculator. 273,305, 4-3-84, Cl. D18-7.000.
La Telephonie Industrielle et Commerciale: *See*—
Moraine, Michel, 273,294, Cl. D14-101.000.
Lambert, Lonnie B. Pistol grip. 273,316, 4-3-84, Cl. D22-1.000.
Leco Corporation: *See*—
Haigh, Richard B.; and Parker, Philip M., 273,280, Cl. D10-91.000.
Lowe, Ted: *See*—
Dilliner, Monte M., 273,296, Cl. D15-05.000.
Macquignon, Claude, to Cambridge Instruments, Inc. Electrocardiograph. 273,325, 4-3-84, Cl. D24-17.000.
Marcus, Cory. Sheet display stand. 273,255, 4-3-84, Cl. D6-85.000.
Marcus, Cory. Frame for a sheet display stand. 273,256, 4-3-84, Cl. D6-85.000.
Markis, Beverly L., to Gillette Company, The. Design for combined bottle and cap. 273,275, 4-3-84, Cl. D9-381.000.
Markson, Morley, to Yorkvest Limited. Footstool. 273,252, 4-3-84, Cl. D6-32.000.
Matsuda, Yasuhiko; and Konda, Kouichi, to Kabushiki Kaisha Sato. Tag printing machine. 273,308, 4-3-84, Cl. D18-13.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Nishimoto, Teruyuki; and Ohta, Kikuo, 273,292, Cl. D14-5.000.
Matt, Joseph B. Belt ring. 273,282, 4-3-84, Cl. D11-30.000.
Matteson, Dale R., to Pro Chalker, Inc. Pool cue chalk container. 273,315, 4-3-84, Cl. D21-232.000.
Matthew Klim Associates, Inc.: *See*—
Klim, Matthew J., 273,276, Cl. D9-383.000.
Mattingly, Glen R.; and Quintanares, Joseph A. Connector for air-breathing apparatus. 273,319, 4-3-84, Cl. D23-40.000.
Mattingly, Glen R.; and Quintanares, Joseph A. Connector for air-breathing apparatus. 273,320, 4-3-84, Cl. D23-40.000.
McCoy, Kenneth H.; and Romain, John. Handle for physical exerciser or similar article. 273,314, 4-3-84, Cl. D21-191.000.
Mihailoff, Jerrold. Road hazard marker. 273,281, 4-3-84, Cl. D10-109.000.
Molaug, Ole. Robot for automatic paint spraying or the like. 273,300, 4-3-84, Cl. D15-199.000.
Moraine, Michel, to La Telephonie Industrielle et Commerciale. Directory terminal. 273,294, 4-3-84, Cl. D14-101.000.
New Balance Athletic Shoe, Inc.: *See*—
Norton, Edward J.; Oparowski, Paul; and Belavitch, Alphonse L., 273,244, Cl. D2-310.000.
Nike, Inc.: *See*—
Tonkel, Raymond, 273,245, Cl. D2-320.000.
Tonkel, Raymond, 273,246, Cl. D2-320.000.
Nishimoto, Teruyuki; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Combined portable radio and cassette tape recorder. 273,292, 4-3-84, Cl. D14-5.000.
Nolff, Robert L., to Propane Carburetion Company, Inc. Bracket for supporting a low pressure gas converter. 273,297, 4-3-84, Cl. D15-5.000.
Norton, Edward J.; Oparowski, Paul; and Belavitch, Alphonse L., to New Balance Athletic Shoe, Inc. Athletic shoe. 273,244, 4-3-84, Cl. D2-310.000.
Ohta, Kikuo: *See*—
Nishimoto, Teruyuki; and Ohta, Kikuo, 273,292, Cl. D14-5.000.
Oparowski, Paul: *See*—
Norton, Edward J.; Oparowski, Paul; and Belavitch, Alphonse L., 273,244, Cl. D2-310.000.
Parker, Philip M.: *See*—
Haigh, Richard B.; and Parker, Philip M., 273,280, Cl. D10-91.000.
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NOTE.—First number, class; second number, subclass; third number, patent number

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48.8 4,440,281
70.2 4,440,282
106.2 4,440,283

CLASS 194

4 R 4,440,284
93 4,440,285

CLASS 198

380 4,440,286
382 4,440,287
425 4,440,288
448 4,440,289
479 4,440,290
488 4,440,291
774 4,440,292
813 4,440,293
838 4,440,294
843 4,440,295

CLASS 200

5 A 4,440,990
4,440,999
6 R 4,440,991
38 R 4,440,993
42 T 4,440,994
144 B 4,440,995
148 A 4,440,996
4,440,997
148 R 4,440,998
291 4,441,000
308 4,441,001
340 4,440,992

CLASS 202

141 4,440,599
248 4,440,600

CLASS 203

24 4,440,601

CLASS 204

1 T 4,440,602
4,440,603
5 4,440,604
16 4,440,605
33 4,440,606
35 N 4,440,607
43 S 4,440,608
43 T 4,440,609
67 4,440,610
147 4,440,611
181 C 4,440,612
206 4,440,613
219 4,440,614
253 4,440,615
272 4,440,616
290 R 4,440,617
298 4,440,618
401 4,440,619
403 4,440,620
406 4,440,621

CLASS 206

3 4,440,296
45.31 4,440,297
216 4,440,298
387 4,440,299
446 4,440,300
456 4,440,301
506 4,440,302
509 4,440,303
586 4,440,304

CLASS 208

8 LE 4,440,622
11 R 4,440,623
22 4,440,624
48 AA 4,440,625
65 4,440,626
4,440,627
4,440,628
4,440,629
111 4,440,630
4,440,631
112 4,440,632
113 4,440,633
309 4,440,634
310 R

CLASS 209

4 4,440,635
10 4,440,636
241 4,440,637

CLASS 210

198.2 4,440,638
222 4,440,639
237 4,440,640
321.3 4,440,641
387 4,440,642
500.2 4,440,643
611 4,440,644
626 4,440,645
699 4,440,646
712 4,440,647
759 4,440,648

CLASS 212

90 4,440,305

CLASS 215

230 4,440,306
307 Re.31,546

CLASS 219

10.55 A 4,441,003
10.55 B 4,441,002
69 C 4,441,005
69 E 4,441,004
85 CM 4,441,006
98 4,441,007
121 LL 4,441,008
124.03 4,441,009
124.34 4,441,010
4,441,011
137 R 4,441,012
231 4,441,013
240 4,441,014
411 4,441,015
441 4,441,016
528 4,441,017

CLASS 220

4 B 4,440,307
204 4,440,308
235 4,440,309
270 4,440,310
306 4,440,311

CLASS 221

24 4,440,312
213 4,440,313

CLASS 222

39 4,440,314
56 4,440,315
83.5 4,440,316
103 4,440,317
129.1 4,440,318
131 4,440,319
145 4,440,320
153 4,440,321
4,440,322
209 4,440,323
326 4,440,324
402.14 4,440,325
450 4,440,326
530 4,440,327
538 4,440,328

CLASS 223

43 4,440,329

CLASS 224

30 R 4,440,330
31 4,440,331
36 4,440,332
258 4,440,334
324 4,440,333

CLASS 226

107 4,440,335

CLASS 227

4 4,440,336

CLASS 228

2 4,440,338
119 4,440,339
173 C 4,440,337

CLASS 229

40 4,440,340
69 4,440,341

CLASS 235

458 4,441,018

CLASS 237

50 4,440,342
69 4,440,343

CLASS 239

102 4,440,344
214 4,440,345
265.39 4,440,346
4,440,347
533.12 4,440,348
698 4,440,349
703 4,440,350

CLASS 241

41 4,440,351
152 A 4,440,352

CLASS 242

47.01 4,440,353
54 R 4,440,354
55 4,440,355
56.5 4,440,356
68.5 4,440,357
189 4,440,358
199 4,440,359

CLASS 244

3.28 4,440,360
36 4,440,361
87 4,440,362
114 R 4,440,363
129.6 4,440,364
137 R 4,440,365
138 R 4,440,366

CLASS 245

6 4,440,367

CLASS 248

27.1 4,440,368
62 4,440,369
75 4,440,370
318 4,440,371
406 4,440,372
461 4,440,373
544 4,440,374
559 4,440,375

CLASS 249

18 4,440,376
119 4,440,377

CLASS 250

201 4,441,019
202 4,441,020
227 4,441,021
308 4,441,022
338 4,441,023
380 4,441,024
516.1 4,441,025
561 4,441,026
577 4,441,027

CLASS 251

117 4,440,378
144 4,440,379
4,440,380
214 4,440,381
248 4,440,382

CLASS 252

8.5 C 4,440,649
8.55 D 4,440,650
4,440,651
4,440,652
8.55 R 4,440,653
34.7 4,440,654
47.5 4,440,655
49.6 4,440,656
49.9 4,440,657
51.5 A 4,440,658
4,440,659
56 S 4,440,660
89.1 4,440,661
106 4,440,662
174.11 4,440,663
188.31 4,440,664
356 4,440,665
392 4,440,666
518 4,440,669
4,440,670
573 4,440,671
586 4,440,672
632 4,440,673

CLASS 260

34 4,440,686
112 R 4,440,675
112.5 R 4,440,676
4,440,677
4,440,678
122 4,440,679
123.7 4,440,680
207.1 4,440,681
239 A 4,440,682
4,440,683
239.57 4,440,684
245.6 4,440,685
349 4,440,687
397.1 4,440,688
397.4 4,440,689
397.45 4,440,690
429.9 4,440,691
439 R 4,440,693
463 4,440,692
465 D 4,440,694
502.5 F 4,440,695
976 4,440,696

CLASS 261

34 A 4,440,697
148 4,440,698

CLASS 264

1.4 4,440,699
8 4,440,700
15 4,440,701
37 4,440,702
50 4,440,703
51 4,440,704
53 4,440,705
56 4,440,706
65 4,440,707
109 4,440,708
145 4,440,709
184 4,440,710
185 4,440,711
209.5 4,440,712
325 4,440,713

CLASS 266

54 4,440,383
149 4,440,384

CLASS 269

13 4,440,385

CLASS 271

70 4,440,386
195 4,440,388
245 4,440,387
251 4,440,389

CLASS 272

27 N 4,440,390
93 4,440,391

CLASS 273

29 BB 4,440,393
73 C 4,440,392
157 R 4,440,394
241 4,440,395
242 4,440,396
256 4,440,397
292 4,440,398
346 4,440,399
411 4,440,400

CLASS 277

50 4,440,401
80 4,440,402
81 R 4,440,403
124 4,440,404
134 4,440,405
207 A 4,440,406
212 F 4,440,407

CLASS 280

7.12 4,440,408
47.13 B 4,440,409
47.26 4,440,410
165 4,440,411
281 B 4,440,412
284 4,440,413
287 4,440,414
460 A 4,440,415
473 4,440,416
478 R 4,440,417
604 4,440,418
661 4,440,419
691 4,440,420
821 4,440,421

CLASS 281

15 R 4,440,422

CLASS 285

25 4,440,423
39 4,440,424
161 4,440,425
239 4,440,426

CLASS 290

52 4,441,028
4,441,029
53 4,441,030
54 4,440,427

CLASS 292

251.5 4,440,428

CLASS 293

120 4,440,429

CLASS 294

1 R 4,440,430
27 H 4,440,431
82 R 4,440,432

CLASS 296

15 4,440,433
107 4,440,436
185 4,440,434
188 4,440,435
190 4,440,437
195 4,440,438

CLASS 297

62 4,440,439
195 4,440,440
216 4,440,441
341 4,440,442
397 4,440,443

CLASS 299

2 4,440,444
4,440,445
4,440,446
4,440,447
11 4,440,448
4,440,449
17 4,440,450

CLASS 301

105 R 4,440,451

CLASS 303

6 A 4,440,452
50 4,440,453
114 4,440,454

CLASS 307

66 4,441,031
82 4,441,032
107 4,441,033
117 4,441,034
200 B 4,441,035
242 4,441,036
265 4,441,037
400 4,441,038
475 4,441,039
491 4,441,040
494 4,441,041

CLASS 308

3.8 4,440,455
184 R 4,440,456
187.2 B1 53,537,725

CLASS 310

42 4,441,042
46 4,441,043
338 4,441,044

CLASS 312

7.2 4,440,457
9 4,440,458
238 4,440,459
320 4,440,460
330 R 4,440,461
348 4,440,462

CLASS 313

25 4,441,045
112 4,441,046
116 4,441,047
346 R 4,441,048
486 4,441,049
493 4,441,050
579 4,441,051

CLASS 315

8 4,441,052
206 4,441,053
219 4,441,054
288 4,441,055
290 4,441,056
368 4,441,057
371 4,441,058

CLASS 318

39 4,441,059
114 4,441,060
329 4,441,061
703 4,441,062
722 4,441,063
798 4,441,064
808 4,441,065

CLASS 320

48 4,441,066

CLASS 322

2 A 4,441,067

CLASS 323

239 4,441,069
268 4,441,070
351 4,441,068
365 4,441,071
368 4,441,072

CLASS 324

52 4,441,073
73 R 4,441,074
4,441,075
158 MG 4,441,076
164 4,441,077
219 4,441,078

CLASS 329

131 4,441,079

CLASS 330

86 4,441,080
110 4,441,081
129 4,441,082

149 4,441,083
4,441,084
293 4,441,085
297 4,441,086

CLASS 331

113 A 4,441,087

CLASS 333

1 4,441,088
105 4,441,089
165 4,441,090
242 4,441,091

CLASS 336

130 4,441,092

CLASS 337

404 4,441,093

CLASS 338

21 4,441,094

CLASS 339

14 R 4,440,463
33 4,440,464
75 P 4,440,465
97 P 4,440,466
154 L 4,440,467

CLASS 340

347 AD 4,441,096
347 DD 4,441,095
365 A 4,441,097
365 R 4,441,098
388 4,441,099
518 4,441,100
606 4,441,101
673 4,441,102
680 4,441,103
724 4,441,104
750 4,441,105
811 4,441,106
870.16 4,441,107

CLASS 343

857 4,441,108

CLASS 346

139 R 4,441,109
140 R 4,441,110
154 4,441,111
163 4,441,112

CLASS 350

96.12 4,440,468
96.20 4,440,469
4,440,470
4,440,471
162.12 4,440,472
342 4,440,473
345 4,440,474
502 4,440,475
538 4,440,476

CLASS 351

212 4,440,477

CLASS 353

25 4,440,478

CLASS 354

110 4,440,480
135 Re.31,547
171 4,440,481
195.1 4,440,482
212 4,440,483
286 4,440,484
322 4,440,485
480 4,440,479

CLASS 355

3 FU 4,440,486
14 R 4,440,487
15 4,440,488
69 4,440,489
72 4,440,490
75 4,440,491
76 4,440,492
86 4,440,493
100 4,440,494

CLASS 356

155 4,440,495
241 4,440,496
246 4,440,497
350 4,440,498

CLASS 357

2 4,441,113
13 4,441,114
38 4,441,115
43 4,441,116
4,441,117
70 4,441,118
74 4,441,119

CLASS 358

10 4,441,120
36 4,441,121
41 4,441,122
44 4,441,123
106 4,441,124
213 4,441,125
293 4,441,126

CLASS 360

71 4,441,127
75 4,441,128
96.5 4,441,129
106 4,441,130
119 4,441,131
126 4,441,132
130.22 4,441,133

CLASS 361

45 4,441,134
47 4,441,135
88 4,441,136
91 4,441,137
274 4,441,138
304 4,441,139
386 4,441,140

CLASS 362

17 4,441,141
158 4,441,142
183 4,441,143
375 4,441,144
384 4,441,145

CLASS 363

20 4,441,146
21 4,441,147
54 4,441,148
91 4,441,149
126 4,441,150

CLASS 364

157 4,441,151
200 4,441,152
4,441,153
4,441,154
4,441,155
431.02 4,441,156
551 4,441,157
758 4,441,158
771 4,441,159
900 4,441,160
4,441,161
4,441,162
4,441,163
4,441,164
4,441,165

CLASS 365

36 4,441,166
94 4,441,167
154 4,441,168
190 4,441,169
200 4,441,170
205 4,441,171
226 4,441,172

CLASS 366

3 4,440,499
177 4,440,500

CLASS 367

13 4,441,173
23 4,441,174

CLASS 368

47 4,440,501
80 4,440,502
107 4,440,503
255 4,440,504
292 4,440,505

CLASS 369

45 4,441,175
170 4,441,176
4,441,177
270 4,441,178
275 4,441,179

CLASS 370

3 4,441,180
4,441,181

CLASS 371

25 4,441,182
4,441,183
40 4,441,184
56 4,441,185

CLASS 372

19 4,441,186
46 4,441,187
54 4,441,188
76 4,441,189

CLASS 373

94 4,441,190
161 4,441,191

CLASS 374

32 4,440,506
39 4,440,507
144 4,440,508
166 4,440,509
169 4,440,510

CLASS 375

14 4,441,192
36 4,441,193
96 4,441,194

CLASS 376

104 4,440,714
210 4,440,715
247 4,440,716
4,440,717
269 4,440,718
372 4,440,719

CLASS 377

2 4,441,195
9 4,441,196
15 4,441,197
78 4,441,198

CLASS 381

14 4,441,199
36 4,441,200
51 4,441,201
68 4,441,202
110 4,441,203

CLASS 382

7 4,441,204
8 4,441,205
4,441,207
08 4,441,206
56 4,441,208

CLASS 383

45 4,441,209

CLASS 384

278 4,440,511

CLASS 400

144.2 4,440,512
165.1 4,440,513
208 4,440,514
479 4,440,515
616.1 4,440,516

CLASS 403

24 4,440,517
297 4,440,518
391 4,440,519

CLASS 404

72 4,440,520
4,440,521

CLASS 405

60 4,440,523
154 4,440,524
186 4,440,525
260 4,440,526
284 4,440,527
293 4,440,522

CLASS 406

90 4,440,528

CLASS 408

1 R 4,440,529
3 4,440,530
82 4,440,531
229 4,440,532

CLASS 409

299 4,440,533

CLASS 411

82 4,440,534
112 4,440,535

CLASS 414

22 4,440,536
139 4,440,537
183 4,440,538
300 4,440,539
462 4,440,540

CLASS 420

459 4,440,720

CLASS 422

16 4,440,721
46 4,440,722
47 4,440,723
56 4,440,724
62 4,440,725
89 4,440,726
197 4,440,727
246 4,440,728

CLASS 423

55 4,440,729
74 4,440,730
228 4,440,731
415 P 4,440,732
437 4,440,733
549 4,440,734
561 B 4,440,735
644 4,440,736
4,440,737

CLASS 424

1.1 4,440,738
4,440,739
4,440,740
65 4,440,741
4,440,742
70 4,440,743
4,440,744
78 4,440,745
4,440,746
4,440,789
85 4,440,747
92 4,440,748
94 4,440,749
95 4,440,750
114 4,440,751
118 4,440,752
124 4,440,753
140 4,440,754
150 4,440,755
174 4,440,756
180 4,440,757
4,440,758
4,440,759
184 4,440,760
195 4,440,761
230 4,440,762
4,440,763
241 4,440,764
244 4,440,765
246 4,440,766
4,440,767
248.4 4,440,768
251 4,440,769
258 4,440,770
4,440,771
261 4,440,772
263 4,440,773
267 4,440,774
269 4,440,775
273 R 4,440,776
274 4,440,777
4,440,778
4,440,779
275 4,440,780
285 4,440,781
287 4,440,782
302 4,440,783
308 4,440,784
317 4,440,785
319 4,440,786
4,440,787
320 4,440,788

CLASS 426

3 4,440,790
43 4,440,791
271 4,440,792
549 4,440,793
578 4,440,794
592 4,440,795
597 4,440,796
613 4,440,797
656 4,440,798

CLASS 427

8 4,440,799
13 4,440,800
54.1 4,440,801
4,440,802
74 4,440,803
91 4,440,804
97 4,440,805
180 4,440,806
221 4,440,807
244 4,440,808
356 4,440,809
376.2 4,440,810
402 4,440,811

CLASS 428

12 4,440,812
15 4,440,813
31 4,440,814
35 4,440,815
40 4,440,816
71 4,440,817
99 4,440,818
107 4,440,819
120 4,440,820
195 4,440,821
209 4,440,823
216 4,440,822
4,440,824
318.6 4,440,825
327 4,440,826
4,440,827
334 4,440,828
343 4,440,829
352 4,440,830
405 4,440,832
425.1 4,440,833
554 4,440,834

CLASS 429

42 4,440,835
48 4,440,836
112 4,440,837
250 4,440,838

CLASS 430

2 4,440,839
4 4,440,840
5 4,440,841
11 4,440,842
55 4,440,843
4,440,844
57 4,440,845
138 4,440,846
146 4,440,847
215 4,440,848
239 4,440,849
325 4,440,850
378 4,440,851
522 4,440,852

CLASS 433

77 Re.31,548

CLASS 435

68 4,440,853
94 4,440,854
105 4,440,855
111 4,440,856
118 4,440,857
129 4,440,858
172 4,440,859
240 4,440,860
306 4,440,861

CLASS 436

6 4,440,862
539 4,440,863

CLASS 455

41 4,441,210

CLASS 501

95 4,440,864
4,440,865
127 4,440,866

CLASS 502

53 4,440,667
62 4,440,867
65 4,440,868
104 4,440,869
207 4,440,870
214 4,440,871
242 4,440,872
244 4,440,873
327 4,440,874
331 4,440,668

CLASS 518

728 4,440,875

CLASS 521 *

123 4,440,876

CLASS 523

105 4,440,877
116 4,440,878
200 4,440,879
205 4,440,880
206 4,440,881
401 4,440,882
402 4,440,883

CLASS 524

26 4,440,884
57 4,440,885
68 4,440,886
99 4,440,887
139 4,440,888
143 4,440,889
159 4,440,890
177 4,440,674
4,440,891
283 4,440,892
305 4,440,893
390 4,440,894
458 4,440,896
460 4,440,897
503 4,440,898
528 4,440,899
569 4,440,900
591 4,440,901
822 4,440,895

CLASS 525

54.1 4,440,903
54.11 4,440,904
54.2 4,440,916
66 4,440,905
68 4,440,906
106 4,440,907
196 4,440,908
277 4,440,909
295 4,440,910
301 4,440,911
404 4,440,902
439 4,440,912
443 4,440,913
482 4,440,914
537 4,440,915

CLASS 526

243 4,440,917
246 4,440,918
263 4,440,919

CLASS 528

128 4,440,920
168 4,440,921
194 4,440,922
216 4,440,923
275 4,440,924
487 4,440,925

CLASS 536

21 4,440,926

CLASS 544

309 4,440,928
346 4,440,929
354 4,440,930

CLASS 546

44 4,440,931
4,440,932
193 4,440,933

CLASS 548

312 4,440,934
326 4,440,935
498 4,440,936

CLASS 549

228 4,440,937
292 4,440,927
495 4,440,938
548 4,440,939

CLASS 560

19 4,440,940
20 4,440,941
40 4,440,942
65 4,440,943
76 4,440,944
86 4,440,945
210 4,440,946
226 4,440,947
247 4,440,958

CLASS 562

532 4,440,948

CLASS 564

48 4,440,949
305 4,440,950
4,440,951
4,440,952
437 4,440,953
439 4,440,954

CLASS 568

30 4,440,964
419 4,440,955
471 4,440,960
604 4,440,959
697 4,440,963
840 4,440,961
933 4,440,962

CLASS 585

12 4,440,965
260 4,440,956
323 4,440,957
415 4,440,966
435 4,440,967
4,440,968
851 4,440,969

CLASSIFICATION OF DESIGNS

D2—	310	273,244		198	273,260		383	273,276	D14—	5	273,292		13	273,308		136	273,324
	320	273,245	D7—	72	273,261		415	273,277		66	273,293	D19—	75	273,309	D24—	17	273,325
		273,246		74	273,262		434	273,278		101	273,294	D21—	13	273,310		27	273,326
	400	273,247		319	273,263	D10—	1	273,279		109	273,295		19	273,311		29	273,327
D6—	3	273,248		332	273,264		91	273,280	D15—	5	273,297		25	273,312		41	273,328
	30	273,249	D8—	1	273,265		109	273,281		05	273,296		166	273,313			273,329
	31	273,250		2	273,266	D11—	30	273,282		81	273,298		191	273,314		51	273,330
		273,251		14	273,267		34	273,283		132	273,299		232	273,315		64	273,331
	32	273,252		83	273,268		45	273,284		199	273,300	D22—	1	273,316	D25—	10	273,332
	61	273,253		321	273,269		157	273,285	D18—	7	273,301		25	273,317		38	273,333
	64	273,254		341	273,270	D12—	6	273,286			273,302		27	273,318		73	273,334
	85	273,255			273,271		107	273,287			273,303	D23—	40	273,319			
		273,256		367	273,272		182	273,288			273,304			273,320	D26—	51	273,335
	87	273,257			273,273	D13—	24	273,289			273,305		90.1	273,321	D28—	63	273,336
	137	273,258		380	273,274			273,290			273,306		97	273,322	D34—	21	273,337
	184	273,259	D9—	381	273,275		40	273,291			273,307		135	273,323		43	273,338

CLASSIFICATION OF PLANTS

P.—	6	5,213		54	5,214			5,215						

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

71—	30	T104,101	357—	50	T104,102									

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,439,948		4,440,867		4,439,953		4,440,471		4,440,209	20 :	4,439,960
	4,440,587		4,440,977		4,439,955		4,440,508		4,440,304		4,440,075
	4,440,600		4,440,979		4,439,980		4,440,839		4,440,307		4,440,740
	4,440,981		4,440,990		4,439,985		4,440,847		4,440,312	21 :	4,439,995
4 :	4,439,935		4,441,009		4,440,011		4,440,910		4,440,320		4,439,998
	4,440,086		4,441,037		4,440,026		4,440,991		4,440,368		4,440,004
	4,440,330		4,441,053		4,440,103		4,441,118		4,440,374		4,440,500
	4,441,145		4,441,082		4,440,189		4,441,197		4,440,394		4,440,755
	4,441,195		4,441,096		4,440,216	10 :	4,440,574		4,440,399		4,440,868
	4,441,200		4,441,104		4,440,219		4,440,768		4,440,405		4,441,029
6 :	4,439,899		4,441,105		4,440,289		4,440,917		4,440,459		4,441,102
	4,439,901		4,441,117		4,440,327	11 :	4,440,916		4,440,478	22 :	4,440,202
	4,439,904		4,441,123		4,440,361	12 :	4,439,957		4,440,494		4,440,218
	4,439,907		4,441,162		4,440,397		4,439,997		4,440,567		4,440,343
	4,439,908		4,441,165		4,440,430		4,440,045		4,440,629		4,440,626
	4,439,966		4,441,167		4,440,433		4,440,076		4,440,677		4,440,627
	4,439,983		4,441,179		4,440,443		4,440,098		4,440,769		4,440,628
	4,440,021		4,441,186		4,440,457		4,440,109		4,440,792		4,440,634
	4,440,030		4,441,193		4,440,515		4,440,137		4,440,815		4,440,667
	4,440,122	8 :	4,439,922		4,440,531		4,440,142		4,440,837		4,440,872
	4,440,146		4,439,958		4,440,550		4,440,291		4,440,842	23 :	4,439,962
	4,440,149		4,440,152		4,440,566		4,440,301		4,440,865		4,439,987
	4,440,155		4,440,445		4,440,607		4,440,318		4,440,894	24 :	4,439,963
	4,440,174		4,440,446		4,440,687		4,440,346		4,440,976		4,440,160
	4,440,182		4,440,447		4,440,723		4,440,347		4,440,986		4,440,184
	4,440,205		4,440,609		4,440,726		4,440,357		4,441,028		4,440,238
	4,440,322		4,441,067		4,440,804		4,440,395		4,441,087		4,440,296
	4,440,358	9 :	4,439,872		4,440,819		4,440,506		4,441,099		4,440,367
	4,440,362		4,439,919		4,440,832		4,440,525		4,441,177		4,440,431
	4,440,365		4,440,013		4,440,853		4,440,636	18 :	4,439,874		4,440,460
	4,440,390		4,440,138		4,440,859		4,441,023		4,439,977		4,440,472
	4,440,391		4,440,261		4,440,969		4,441,077		4,440,015		4,440,716
	4,440,423		4,440,290		4,441,036		4,441,079		4,440,042		4,440,730
	4,440,436		4,440,303		4,441,056		4,441,092		4,440,058		4,440,747
	4,440,449		4,440,306		4,441,071		4,441,098		4,440,118		4,440,771
	4,440,465		4,440,310		4,441,081	13 :	4,440,059		4,440,264	25 :	4,439,926
	4,440,485		4,440,338		4,441,097		4,440,180		4,440,342		4,439,949
	4,440,517		4,440,466		4,441,106		4,440,393		4,440,428		4,439,975
	4,440,518		4,440,717		4,441,114		4,440,480		4,440,456		4,440,031
	4,440,538		4,440,825		4,441,158		4,440,988		4,440,702		4,440,108
	4,440,542		4,440,855		4,441,160		4,441,027		4,440,931		4,440,114
	4,440,563		4,440,941		4,441,166		4,441,143		4,440,932		4,440,154
	4,440,579		4,441,025		4,441,170	15 :	4,440,164		4,441,052		4,440,165
	4,440,588	04 :	4,440,713		4,441,172	16 :	4,441,125		4,441,058		4,440,482
	4,440,593		4,440,972	08 :	4,440,009	17 :	4,439,885		4,441,086		4,440,523
	4,440,594		4,441,070		4,440,150		4,439,890		4,441,176		4,440,541
	4,440,623	05 :	4,439,952		4,440,404		4,439,893	19 :	4,440,040		4,440,547
	4,440,679	06 :	Re.31,548		4,440,427		4,440,036		4,440,179		4,440,635
	4,440,695		4,439,876		4,440,444		4,440,041		4,440,285		4,440,672
	4,440,719		4,439,889		4,441,175		4,440,078		4,440,474		4,440,750
	4,440,733		4,439,910	09 :	4,440,083		4,440,101		4,440,637		4,440,818
	4,440,780		4,439,917		4,440,191		4,440,115		4,440,993		4,440,822
	4,440,862		4,439,937		4,440,192		4,440,200		4,441,182		4,440,824

	4,440,854		4,440,319		4,441,069		4,440,441		4,440,080		4,440,243
	4,440,860		4,440,379		4,441,076		4,440,994		4,440,091		4,440,247
	4,440,863		4,440,380		4,441,080	39 :	4,439,880		4,440,096		4,440,262
	4,440,912		4,440,559		4,441,090		4,439,897		4,440,158		4,440,273
	4,441,002		4,440,562		4,441,121		4,439,921		4,440,161		4,440,288
	4,441,003		4,440,725		4,441,137		4,439,923		4,440,172		4,440,325
	4,441,019		4,440,777		4,441,146		4,439,924		4,440,237		4,440,364
	4,441,054		4,440,954		4,441,183		4,439,930		4,440,316		4,440,383
	4,441,140		4,440,964		4,441,188		4,439,988		4,440,349		4,440,389
26 :	4,439,877		4,440,967		4,441,189		4,440,018		4,440,396		4,440,410
	4,439,888		4,440,968	35 :	4,440,062		4,440,035		4,440,426		4,440,476
	4,439,927	30 :	4,440,861		4,440,175		4,440,204		4,440,469		4,440,477
	4,439,959		4,441,135		4,440,215		4,440,206		4,440,534		4,440,498
	4,439,972	31 :	4,439,956		4,441,024		4,440,213		4,440,543		4,440,529
	4,439,986		4,440,373	36 :	Re.31,547		4,440,270		4,440,546		4,440,605
	4,439,992	33 :	4,439,936		4,439,871		4,440,308		4,440,568		4,440,611
	4,439,996		4,440,639		4,439,873		4,440,336		4,440,606		4,440,625
	4,440,023		4,440,992		4,439,920		4,440,425		4,440,610		4,440,638
	4,440,027	34 :	4,439,925		4,439,947		4,440,497		4,440,612		4,440,649
	4,440,037		4,439,950		4,439,964		4,440,509		4,440,613		4,440,650
	4,440,039		4,439,973		4,439,984		4,440,520		4,440,647		4,440,652
	4,440,068		4,440,024		4,440,017		4,440,528		4,440,714		4,440,666
	4,440,107		4,440,055		4,440,038		4,440,539		4,440,746		4,440,724
	4,440,116		4,440,063		4,440,044		4,440,557		4,440,774		4,440,731
	4,440,120		4,440,069		4,440,052		4,440,572		4,440,826		4,440,870
	4,440,121		4,440,169		4,440,079		4,440,597		4,440,830		4,440,891
	4,440,123		4,440,170		4,440,084		4,440,608		4,440,881		4,440,956
	4,440,125		4,440,225		4,440,094		4,440,616		4,440,885		4,440,984
	4,440,168		4,440,271		4,440,145		4,440,640		4,440,897		4,440,987
	4,440,181		4,440,311		4,440,163		4,440,663		4,440,904		4,441,062
	4,440,185		4,440,321		4,440,176		4,440,674		4,440,905		4,441,119
	4,440,217		4,440,411		4,440,234		4,440,738		4,440,921		4,441,154
	4,440,267		4,440,424		4,440,249		4,440,754		4,440,927		4,441,163
	4,440,274		4,440,450		4,440,259		4,440,781		4,440,949		4,441,174
	4,440,287		4,440,510		4,440,269		4,440,814		4,440,970		4,441,201
	4,440,333		4,440,577		4,440,315		4,440,816		4,440,971	49 :	4,440,060
	4,440,372		4,440,604		4,440,317		4,440,829		4,440,995		4,440,332
	4,440,442		4,440,622		4,440,334		4,440,836		4,440,996		4,440,384
	4,440,451		4,440,630		4,440,341		4,440,846		4,440,997		4,441,194
	4,440,455		4,440,646		4,440,350		4,440,889		4,440,998	50 :	4,440,973
	4,440,535		4,440,655		4,440,402		4,440,908		4,441,124	51 :	4,439,912
	4,440,545		4,440,656		4,440,458		4,440,909		4,441,126		4,439,974
	4,440,553		4,440,657		4,440,462		4,440,930		4,441,168		4,440,047
	4,440,554		4,440,658		4,440,463		4,440,936		4,441,173		4,440,245
	4,440,555		4,440,668		4,440,492		4,441,012		4,441,205		4,440,284
	4,440,582		4,440,669		4,440,576		4,441,046	44 :	4,440,728		4,440,421
	4,440,603		4,440,670		4,440,589		4,441,047	45 :	4,440,144		4,440,556
	4,440,659		4,440,671		4,440,601		4,441,051		4,441,063		4,440,558
	4,440,706		4,440,680		4,440,617		4,441,203	46 :	4,440,644		4,440,675
	4,440,708		4,440,682		4,440,743	40 :	4,439,943	47 :	4,439,944		4,440,785
	4,440,721		4,440,685		4,440,758		4,439,994		4,440,102		4,441,064
	4,440,782		4,440,690		4,440,790		4,440,220		4,440,193		4,441,112
	4,440,812		4,440,704		4,440,801		4,440,228		4,440,302	53 :	4,439,934
	4,440,943		4,440,711		4,440,803		4,440,231		4,440,356		4,440,061
	4,440,952		4,440,736		4,440,810		4,440,381		4,440,422		4,440,088
	4,441,008		4,440,737		4,440,831		4,440,536		4,440,614		4,440,277
	4,441,042		4,440,741		4,440,848		4,440,548		4,440,664		4,440,331
	4,441,113		4,440,742		4,440,866		4,440,651		4,440,888		4,440,385
	4,441,156		4,440,748		4,440,871		4,440,653		4,440,922		4,440,512
	4,441,207		4,440,751		4,440,914		4,440,807	48 :	4,439,928		4,440,965
	3,537,725		4,440,763		4,440,919		4,440,869		4,439,954		4,440,978
27 :	4,439,909		4,440,765		4,440,929		4,440,886		4,439,961		4,441,013
	4,440,005		4,440,779		4,440,933		4,440,893		4,439,968	54 :	4,440,305
	4,440,066		4,440,783		4,440,940		4,440,950		4,440,000	55 :	4,439,939
	4,440,112		4,440,789		4,441,015		4,440,951		4,440,019		4,440,028
	4,440,173		4,440,799		4,441,018		4,440,953		4,440,020		4,440,105
	4,440,177		4,440,805		4,441,022		4,440,963		4,440,032		4,440,111
	4,440,359		4,440,874		4,441,039	41 :	4,439,883		4,440,043		4,440,207
	4,440,370		4,440,877		4,441,068		4,440,143		4,440,183		4,440,214
	4,440,376		4,440,890		4,441,073		4,440,159		4,440,221		4,440,258
	4,440,398		4,440,907		4,441,075		4,440,208		4,440,222		4,440,293
	4,440,798		4,440,935		4,441,088		4,440,378		4,440,223		4,440,351
	4,440,884		4,440,939		4,441,094		4,440,753		4,440,226		4,440,369
	4,440,918		4,440,942		4,441,153	42 :	Re.31,546		4,440,227		4,440,407
	4,440,999		4,440,944		4,441,155		4,439,914		4,440,229		4,440,415
	4,441,017		4,440,945		4,441,196		4,439,941		4,440,230		4,440,795
	4,441,072		4,440,946		4,441,199		4,439,946		4,440,232		4,440,809
	4,441,157		4,440,961	37 :	4,439,892		4,439,969		4,440,233		4,440,838
29 :	4,439,878		4,440,985		4,440,071		4,439,971		4,440,239		4,440,898
	4,439,879		4,441,043		4,440,082		4,439,993		4,440,241		4,441,021
	4,439,918		4,441,066		4,440,095		4,440,070				

DESIGN PATENTS

01 :	273,321		273,332		273,318	33 :	273,244		273,290	44 :	273,262
04 :	273,319	09 :	273,248	19 :	273,296		273,245		273,325	48 :	273,247
	273,320		273,276	20 :	273,268		273,246		273,336		273,257
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	273,256	12 :	273,253	24 :	273,287	36 :	273,249	39 :	273,263		273,316
	273,259		273,274	25 :	273,275		273,250		273,279		273,333
	273,264		273,324		273,312		273,251		273,291	50 :	273,267
	273,265		273,327		273,329		273,269		273,331	53 :	273,293
	273,295	17 :	273,285	26 :	273,280		273,270	42 :	273,266	55 :	273,286
	273,309		273,330		273,282		273,271		273,272		273,288
	273,314		273,337		273,297		273,277		273,299		273,315
	273,328	18 :	273,258	29 :	273,298		273,289		273,317		

PLANT PATENTS

06 :	5,213		5,215	12 :	5,214						

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

01 :	T104,101	36 :	T104,102								

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